

Study plan

Name of study plan: ID nav.prez.17/18

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Technology in Transportation and Telecommunications

Type of study: Follow-up master full-time

Required credits: 47

Elective courses credits: 73

Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 26

The role of the block: Z

Code of the group: 1.S.NPID 11/12

Name of the group: 1.sem.nav.prez.ID od 11/12

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 8 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
11TER	Game Theory and Optimal Decision-Making Magdalena Hykšová Magdalena Hykšová Magdalena Hykšová (Gar.)	ZK	2	2P+0C+8B	Z	z
17LOGR	Logistics Chains	Z,ZK	5	2+2	Z	z
20SK	Signals and Codes	Z,ZK	4	2P+1C	Z	z
20SSI	System and Reliability Engineering	ZK	4	4+0	Z	z
20TSS	Telematic Systems and Services	Z,ZK	3	2+1	Z	z
11MAG	Algorithms	KZ	4	2+2	Z	z
14GISS	Geographical Information Systems Tomáš Janata, František Kekula	KZ	2	0P+2C+8B	Z	z
15J2A1	Language - English 1 Markéta Musilová, Jitka He manová, Marie Michlová, Lenka Monková, Markéta Vojanová, Peter Morpuss, Jan Feit, Eva Rezlerová	Z	2	0P+2C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=1.S.NPID 11/12 Name=1.sem.nav.prez.ID od 11/12

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.
17LOGR	Logistics Chains	Z,ZK	5	Logistics chain. Logistics system. Horizontal and vertical dimensions of logistics integration. The types of logistics chains. Logistics chain with continual flows, with interrupted flows, with synchronous flows. Management based on an independent method of planning. Management based on planning in closed circle with information feedback. Possible position of the decoupling point in a logistics chain. Chain effects. Case studies.
20SK	Signals and Codes	Z,ZK	4	Time and frequency representation of signals. Discretization of signals, sampling, quantization and coding. Signal transmission, modulation and coding. Coding theory, information theory. Checksums and selfcorrecting codes. Cryptography protocols. MATLAB exercises. Practical applications of coding and modulation.
20SSI	System and Reliability Engineering	ZK	4	Enlarged definition of system in space of engineer tasks, specification of selected types of systems versus linked tools of system analysis and projection, specifying of selected types of system engineering tasks. Predicative diagnostics, safety in the traffic vehicles, safety infrastructure, human in the transportation and traffic systems, security of information in transportation.
20TSS	Telematic Systems and Services	Z,ZK	3	Telematic theory, telematic architecture, FRAME, cooperative systems - technologies, principles and applications, European electronic toll service, traffic information systems, e-call, automated vehicle systems, European railway traffic management system.

11MAG	Algorithms	KZ	4
Fundamentals of discrete and numerical algorithms and numerical methods. Practical exercises on selected algorithms, error analysis of numerical algorithms, comparison of possible variants of a numerical algorithm.			
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			
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.			

Name of the block: Semestrální projekt

Minimal number of credits of the block: 13

The role of the block: ZP

Code of the group: XN1-4 14/15

Name of the group: Projekty nav.prez.1.-4.sem (obory PL + DS, LA, [BT]) od 14/15

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
12XN1	Master Project 1 Zuzana arská, Kristýna Neubergová, Iva Šturmová, Martin Jacura, Tomáš Javoík, Lukáš Týfa, Jiří arský, Josef Kocourek, Tomáš Padlek,	Z	2	0P+2C+4B	Z	ZP
14XN1	Master Project 1 Tomáš Brandejský, Vít Fábera, Mária Jánešová, Jan Zelenka	Z	2	0P+2C+4B	Z	ZP
15XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
16XN1	Master Project 1 Josef Mík, Josef Svoboda, P emysl Toman, Dmitrij Rožd stvenský	Z	2	0P+2C+4B	Z	ZP
17XN1	Master Project 1 Václav Baroch, Edvard Bezina, Michal Drábek, Alexandra Dvoáková, Veronika Faifrová, Tomáš Horák, Vít Janoš, Milan Kíž, Olga Mertlová,	Z	2	0P+2C+4B	Z	ZP
18XN1	Master Project 1 Radim Dvoák, Jaroslav Valach, Daniel Kytý, Petr Koudelka, Tomáš Fíla, Jan Šleichrt, Ján Kopa ka, Radek Kolman	Z	2	0P+2C+4B	Z	ZP
20XN1	Master Project 1 Jiří Ržika, Patrik Horažovský	Z	2	0P+2C+4B	Z	ZP
21XN1	Master Project 1 Peter Vittek, Vladimír Socha, Andrej Lališ, Stanislav Kušmírek, Anna Polánecká, Milan Kameník, Jakub Kraus, Slobodan Stoji, Terézia Pilmannová,	Z	2	0P+2C+4B	Z	ZP
22XN1	Master Project 1 Tomáš Miunek, Michal Frydřín, Karel Kocián, Luboš Nouzovský, Zdenek Svátý	Z	2	0P+2C+4B	Z	ZP
23XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
11XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
12XN2	Master Project 2 Zuzana arská, Martin Jacura, Tomáš Javoík, Lukáš Týfa, Jiří arský, Josef Kocourek, Tomáš Padlek, Vojtech Novotný, Petr Kumpošt,	Z	2	0P+2C+8B	L	ZP
14XN2	Master Project 2 Tomáš Brandejský, Vít Fábera, Mária Jánešová, Jan Zelenka Vít Fábera (Gar.)	Z	2	0P+2C+8B	L	ZP
15XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
16XN2	Master Project 2 Josef Mík, P emysl Toman, Petr Bouchner	Z	2	0P+2C+8B	L	ZP
17XN2	Master Project 2 Václav Baroch, Edvard Bezina, Michal Drábek, Veronika Faifrová, Tomáš Horák, Vít Janoš, Milan Kíž, Olga Mertlová, Zdenek Michl,	Z	2	0P+2C+8B	L	ZP
18XN2	Master Project 2 Jaroslav Valach, Daniel Kytý, Tomáš Fíla, Petr Zlámal Daniel Kytý Daniel Kytý (Gar.)	Z	2	0P+2C+8B	L	ZP
20XN2	Master Project 2 Patrik Horažovský	Z	2	0P+2C+8B	L	ZP
21XN2	Master Project 2 Peter Vittek, Andrej Lališ, Jakub Kraus, Slobodan Stoji, Terézia Pilmannová, Lenka Hanáková, Jakub Hospodka, Natalia Guskova, Kateřina Grötschelová	Z	2	0P+2C+8B	L	ZP
22XN2	Master Project 2 Michal Frydřín, Karel Kocián, Luboš Nouzovský, Zdenek Svátý, Jakub Nováek	Z	2	0P+2C+8B	L	ZP
23XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
11XN3	Master Project 3	Z	1	0P+4C	Z	ZP

12XN3	Master Project 3 Zuzana arská, Kristýna Neubergová, Iva Šturmová, Martin Jacura, Tomáš Javoík, Lukáš Týfa, Jiří arský, Josef Kocourek, Tomáš Padlek,	Z	1	0P+4C	Z	ZP
14XN3	Master Project 3 Tomáš Brandejský, Vít Fábera, Mária Jánešová, Jan Zelenka	Z	1	0P+4C	Z	ZP
15XN3	Master Project 3	Z	1	0P+4C	Z	ZP
16XN3	Master Project 3	Z	1	0P+4C	Z	ZP
17XN3	Master Project 3 Václav Baroch, Edvard Bezina, Michal Drábek, Alexandra Dvořáková, Veronika Faifrová, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová,	Z	1	0P+4C	Z	ZP
18XN3	Master Project 3	Z	1	0P+4C	Z	ZP
20XN3	Master Project 3 Jiří Ržika, Patrik Horažovský	Z	1	0P+4C	Z	ZP
21XN3	Master Project 3 Peter Vittek, Vladimír Socha, Andrej Lališ, Stanislav Kušmírek, Anna Polánecká, Jakub Kraus, Slobodan Stojić, Terézia Pilmannová, Lenka Hanáková,	Z	1	0P+4C	Z	ZP
22XN3	Master Project 3 Tomáš Mišuněk, Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zdeněk Svátý	Z	1	0P+4C	Z	ZP
23XN3	Master Project 3	Z	1	0P+4C	Z	ZP
11XN4	Master Project 4	Z	8	0P+4C	L	ZP
12XN4	Master Project 4 Zuzana arská, Martin Jacura, Tomáš Javoík, Lukáš Týfa, Jiří arský, Josef Kocourek, Tomáš Padlek, Vojtěch Novotný, Petr Kumpošt,	Z	8	0P+4C	L	ZP
14XN4	Master Project 4 Tomáš Brandejský, Vít Fábera, Mária Jánešová, Jan Zelenka	Z	8	0P+4C	L	ZP
15XN4	Master Project 4	Z	8	0P+4C	L	ZP
16XN4	Master Project 4	Z	8	0P+4C	L	ZP
17XN4	Master Project 4 Václav Baroch, Edvard Bezina, Michal Drábek, Alexandra Dvořáková, Veronika Faifrová, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová,	Z	8	0P+4C	L	ZP
18XN4	Master Project 4	Z	8	0P+4C	L	ZP
20XN4	Master Project 4 Jiří Ržika, Zuzana Bělinová	Z	8	0P+4C	L	ZP
21XN4	Master Project 4 Peter Vittek, Andrej Lališ, Stanislav Kušmírek, Anna Polánecká, Jakub Kraus, Slobodan Stojić, Terézia Pilmannová, Lenka Hanáková, Jakub Hospodka,	Z	8	0P+4C	L	ZP
22XN4	Master Project 4 Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zdeněk Svátý, Jakub Nováček	Z	8	0P+4C	L	ZP
23XN4	Master Project 4	Z	8	0P+4C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=XN1-4 14/15 Name=Projekty nav.prez.1.-4.sem (obory PL + DS, LA, [BT]) od 14/15

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: Jazyky

Minimal number of credits of the block: 8

The role of the block: J

Code of the group: JZ-N-14/15

Name of the group: Jazyk nav.1.-4.sem. od 14/15 (pro obory v N3710)

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	Language - French 1 <i>Eva Rezlerová, Irena Veselková</i>	Z	2	CP+2C+10B	Z	J
15J2I1	Language - Italian 1 <i>Irena Veselková</i>	Z	2	CP+2C+10B	Z	J
15J2N1	Language - German 1 <i>Eva Rezlerová, Jana Štikarová, Ester Prokešová</i>	Z	2	CP+2C+10B	Z	J
15J2R1	Language - Russian 1 <i>Marie Michlová, Eva Rezlerová</i>	Z	2	CP+2C+10B	Z	J
15J2S1	Language - Spanish 1 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	CP+2C+10B	Z	J
15JBF2	Language - French 2 <i>Eva Rezlerová, Irena Veselková</i>	Z	2	CP+2C+10B	L	J
15JBI2	Language - Italian 2 <i>Irena Veselková</i>	Z	2	CP+2C+10B	L	J
15JBN2	Language - German 2 <i>Eva Rezlerová, Jana Štikarová, Ester Prokešová</i>	Z	2	CP+2C+10B	L	J
15JBR2	Language - Russian 2 <i>Marie Michlová, Eva Rezlerová</i>	Z	2	CP+2C+10B	L	J
15JBS2	Language - Spanish 2 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	CP+2C+10B	L	J
15JBF3	Language - French 3 <i>Eva Rezlerová, Irena Veselková</i>	Z	2	CP+2C+10B	Z	J
15JBI3	Language - Italian 3 <i>Irena Veselková</i>	Z	2	CP+2C+10B	Z	J
15JBN3	Language - German 3 <i>Eva Rezlerová, Jana Štikarová</i>	Z	2	CP+2C+10B	Z	J
15JBR3	Language - Russian 3 <i>Marie Michlová, Eva Rezlerová</i>	Z	2	CP+2C+10B	Z	J
15JBS3	Language - Spanish 3 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	CP+2C+10B	Z	J
15JBF4	Language - French 4 <i>Eva Rezlerová, Irena Veselková</i>	ZK	2	CP+2C+10B	L	J
15JBI4	Language - Italian 4 <i>Irena Veselková</i>	ZK	2	CP+2C+10B	L	J
15JBN4	Language - German 4 <i>Eva Rezlerová, Jana Štikarová</i>	ZK	2	CP+2C+10B	L	J

15JBR4	Language - Russian 4 <i>Marie Michlová, Eva Rezlerová</i>	ZK	2	CP+2C+10B	L	J
15JBS4	Language - Spanish 4 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	ZK	2	CP+2C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-N-14/15 Name=Jazyk nav.1.-4.sem. od 14/15 (pro obory v N3710)

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
11MAG	Algorithms	KZ	4
Fundamentals of discrete and numerical algorithms and numerical methods. Practical exercises on selected algorithms, error analysis of numerical algorithms, comparison of possible variants of a numerical algorithm.			
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.			
11XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2
11XN3	Master Project 3	Z	1
11XN4	Master Project 4	Z	8
12XN1	Master Project 1	Z	2
12XN2	Master Project 2	Z	2
12XN3	Master Project 3	Z	1
12XN4	Master Project 4	Z	8
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			
14XN1	Master Project 1	Z	2
14XN2	Master Project 2	Z	2
14XN3	Master Project 3	Z	1
14XN4	Master Project 4	Z	8
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.			

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
16XN1	Master Project 1	Z	2
16XN2	Master Project 2	Z	2
16XN3	Master Project 3	Z	1
16XN4	Master Project 4	Z	8

17LOGR	Logistics Chains	Z,ZK	5
Logistics chain. Logistics system. Horizontal and vertical dimensions of logistics integration. The types of logistics chains. Logistics chain with continual flows, with interrupted flows, with synchronous flows. Management based on an independent method of planning. Management based on planning in closed circle with information feedback. Possible position of the decoupling point in a logistics chain. Chain effects. Case studies.			
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	Z	2
17XN3	Master Project 3	Z	1
17XN4	Master Project 4	Z	8
18XN1	Master Project 1	Z	2
18XN2	Master Project 2	Z	2
18XN3	Master Project 3	Z	1
18XN4	Master Project 4	Z	8
20SK	Signals and Codes	Z,ZK	4
Time and frequency representation of signals. Discretization of signals, sampling, quantization and coding. Signal transmission, modulation and coding. Coding theory, information theory. Checksums and selfcorrecting codes. Cryptography protocols. MATLAB exercises. Practical applications of coding and modulation.			
20SSI	System and Reliability Engineering	ZK	4
Enlarged definition of system in space of engineer tasks, specification of selected types of systems versus linked tools of system analysis and projection, specifying of selected types of system engineering tasks. Predicative diagnostics, safety in the traffic vehicles, safety infrastructure, human in the transportation and traffic systems, security of information in transportation.			
20TSS	Telematic Systems and Services	Z,ZK	3
Telematic theory, telematic architecture, FRAME, cooperative systems - technologies, principles and applications, European electronic toll service, traffic information systems, e-call, automated vehicle systems, European railway traffic management system.			
20XN1	Master Project 1	Z	2
20XN2	Master Project 2	Z	2
20XN3	Master Project 3	Z	1
20XN4	Master Project 4	Z	8
21XN1	Master Project 1	Z	2
21XN2	Master Project 2	Z	2
21XN3	Master Project 3	Z	1
21XN4	Master Project 4	Z	8
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22XN3	Master Project 3	Z	1
22XN4	Master Project 4	Z	8
23XN1	Master Project 1	Z	2
23XN2	Master Project 2	Z	2
23XN3	Master Project 3	Z	1
23XN4	Master Project 4	Z	8

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