Study plan

Name of study plan: Master Full-Time DS from 2026/27

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Transportation Systems and Technology
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: 1S-NP-DS-20/21
Name of the group: 1st Sem. Master Full-Time DS from 2020/21
Requirement credits in the group: In this group you have to gain 22 credits
Requirement courses in the group: In this group you have to complete 7 courses
Credits in the group: 22
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
12IKD	**Rail Transport Infrastructure** *Lukáš Týfa, Ondřej Trešl*	Z,ZK	5	2P+2C	Z	z
12TKVP	**Highway Engineering Materials** *Otakar Vacín Otakar Vacín (Gar.)*	Z,ZK	4	2P+2C	Z	z
18GAZ	**Geomechanics and Foundation Engineering** *Aleš Šmejda, Jitka Řezníčková, Linda Černá Vydrová, Vít Malinovský* ***Linda Černá Vydrová*** *Linda Černá Vydrová (Gar.)*	Z,ZK	3	2P+1C	Z	z
18TIK	**Theory of Engineering Structures** *Petr Koudelka, Petr Zlámal, Ondřej Jiroušek, Ján Kopačka* ***Ondřej Jiroušek*** *Ondřej Jiroušek (Gar.)*	Z,ZK	4	2P+1C	Z	z
14GISS	**Geographical Information Systems** *Vít Fábera, František Kekula, Tomáš Janata, Zuzana Purkrábková* ***Tomáš Janata*** *Tomáš Janata (Gar.)*	KZ	2	0P+2C+8B	Z	z
22MSV	**Modelling and Vehicle Movement Simulation** *Michal Frydrýn, Drahomír Schmidt* ***Michal Frydrýn*** *Drahomír Schmidt (Gar.)*	KZ	2	0P+2C	Z	z
15J2A1	**Language - English 1** *Jitka Heřmanová, Peter Morpuss, Markéta Vojanová, Marie Michlová, Marek Tomeček, Markéta Musilová, Jan Feit, Eva Rezlerová, Lenka Monková, ... Lenka Monková (Gar.)*	Z	2	0P+2C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=1S-NP-DS-20/21 Name=1st Sem. Master Full-Time DS from 2020/21

12IKD	Rail Transport Infrastructure	Z,ZK	5
Non-compensated lateral acceleration, parameters eduction for transition curve and cant transition, curves without straight, track spacing change. Track detailed construction. Substructure design, slab track. Tram-train. Interoperability. Noise precautions. Railway line modernization for non-tilting and tilting trains.			
12TKVP	Highway Engineering Materials	Z,ZK	4
The theory of road construction - Material Aspects. The course emphasizes the development of road construction from the beginning of the 20th century to the present, focusing on materials, understanding the production and placing of asphalt mixtures.			
18GAZ	Geomechanics and Foundation Engineering	Z,ZK	3
Geology (basics of pertrographyand stratigraphy), mechanics of soils (classification of fundamental soils, mechanic properties of fundamental soils, permeability), planar foundations (footings, footers, plates, depth of founding), determination of planar foundations bearing and deformation, depth foundations classification of depth foundations elements, examples of their use, piles (classification, technology od performing).			
18TIK	Theory of Engineering Structures	Z,ZK	4
The course builds upon the knowledge gained in basic mechanics courses in bachelor study (especially Statics and Elasticity) in the field of mathematical theory of elasticity. Emphasis is placed on plane and axisymmetric problems, as well as on the calculation of stress and strain in plates and shells. Students are further acquainted with methods of modeling the behavior of subsoil used in the design of line structures.			

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			
22MSV	Modelling and Vehicle Movement Simulation	KZ	2
Principles and posibilities of simulation tools with regards to vehicle movement analysis and vehicle crash analysis. Kinematic and dynamic modelling of vehicle/set of vehicles movement. View conditions. Proposed road space passage. Processing of road 3D models.			
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: 1S-NP-DS-V1-22/23
Name of the group: 1st Sem. Master Full-Time DS Alternative from 2022/23
Requirement credits in the group: In this group you have to gain 4 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 4
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
17DOPD	**Transportation Planning and Modeling** *Ondřej Přibyl, Milan Kříž Milan Kříž (Gar.)*	Z,ZK	4	2P+2C	Z	z
17TZND	**Technology of Railway Transport** *Michal Drábek, Zdeněk Michl, Vít Janoš, Rudolf Vávra Vít Janoš (Gar.)*	Z,ZK	4	2P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=1S-NP-DS-V1-22/23 Name=1st Sem. Master Full-Time DS Alternative from 2022/23

17DOPD	Transportation Planning and Modeling	Z,ZK	4
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.			
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.			

Code of the group: 2S-NP-DS-20/21
Name of the group: 2nd Sem. Bachelor Full-Time DS from 2020/21
Requirement credits in the group: In this group you have to gain 20 credits
Requirement courses in the group: In this group you have to complete 6 courses
Credits in the group: 20
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
12NAPI	**Design and Maintenance of Transportation Structures**	Z,ZK	4	2P+2C	L	z
12UMUP	**Sustainable Mobility and Land - Use Planning**	Z,ZK	5	2P+2C	L	z
12ZSUZ	**Railway Stations and Centres**	Z,ZK	3	2P+1C	L	z
16PDP	**Principles of Vehicle Design**	ZK	2	2P+0C+8B	L	z
22AMMD	**Measuring Methods Applied to Transportation** ***Luboš Nouzovský***	KZ	4	1P+3C	L	z
15JBA2	**Language - English 2**	Z	2	0P+2C+10B	L	z

Characteristics of the courses of this group of Study Plan: Code=2S-NP-DS-20/21 Name=2nd Sem. Bachelor Full-Time DS from 2020/21

12NAPI	Design and Maintenance of Transportation Structures	Z,ZK	4
Design and construction of cement-concrete pavements and their maintenance. Construction of bridge objects, examples and choice of bridge construction materials. Construction and operation of tunnels.			
12UMUP	Sustainable Mobility and Land - Use Planning	Z,ZK	5
Spatial planning - objectives and tasks, development over time. Land-use planning tools. SUMP. Territorial and transport planning context. Ways of urban growth in connection with transport. Basic principles of the transport solution. The impact of transport on the size and shape of the city, on the development of the street and the square and the roads. Solutions for pedestrian and bicycle transport. Suburbanization and transport. City economics.			
12ZSUZ	Railway Stations and Centres	Z,ZK	3
Equipment for passenger transport. Platform construction. Access roads to platforms. Modification of railway stations according to the TSI PRM. Station heads design. Variant solutions of station heads for current ride. Junction stations. Crossing stations. Passenger stations. Moving stations. Public transport terminals.			
16PDP	Principles of Vehicle Design	ZK	2
Design of transportation vehicle according to its usage and function. Marketing and user demands. Vehicle dynamics. Propulsion systems. Design process, functional design and vehicle structure. Evaluation of variant concepts. Design phases. Realiability, technological aspects etc.			

22AMMD	Measuring Methods Applied to Transportation	KZ	4
Geodetic location and technical processing of traffic route with geodetic total station, GPS and photogrammetry, 3D scanning. Transport corridor setting out using geodetic methods. Detection and technical processing of several vehicle dynamic characteristics using high-speed cameras and accelerometers. It is a week course and the terms are usually set in June and September - usually in examination period.			
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: 2S-NP-DS-V-20/21
Name of the group: 2nd Sem. Master Full-Time DS Alternative from 2020/21
Requirement credits in the group: In this group you have to gain 4 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 4
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
12BED	**Road Safety Audit**	Z,ZK	4	2P+1C	L	z
18TEAM	**Theoretical and Applied Mechanics**	Z,ZK	4	2P+1C	L	z

Characteristics of the courses of this group of Study Plan: Code=2S-NP-DS-V-20/21 Name=2nd Sem. Master Full-Time DS Alternative from 2020/21

12BED	Road Safety Audit	Z,ZK	4
Schedules of applications of safety assessments (especially Road Safety Audit, Road Safety Inspection) during the process of preparations, and of the particular realization of the road network that should minimize traffic accident risks for all those who take part in road traffic. Application of European Directive 2008/96/EC on road safety infrastructure management.			
18TEAM	Theoretical and Applied Mechanics	Z,ZK	4
Fundamentals of theory of plasticity. Plasticity conditions. Elastoplastic and plastic states of cross-sections and beams. Reliability and durability of structures. The stress and strain state around a notch. Stress intensity factor. Fracture toughness. Energy methods of linear fracture mechanics. Crack driving force.			

Code of the group: 3S-NP-DS-21/22
Name of the group: 3rd Sem. Bachelor Full-Time DS from 2021/22
Requirement credits in the group: In this group you have to gain 20 credits
Requirement courses in the group: In this group you have to complete 5 courses
Credits in the group: 20
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
11STS	**Stochastic Systems** *Šárka Trsťanová, Evženie Uglickich, Šárka Voráčová, Natálie Blahitka, Michal Matowicki, Pavla Pecherková **Pavla Pecherková** Šárka Voráčová (Gar.)*	Z,ZK	4	2P+2C+14B	Z	z
12DAZP	**Transport and Environment** *Lukáš Týfa Lukáš Týfa (Gar.)*	Z,ZK	4	2P+1C	Z	z
12TEAP	**Theory of Road Traffic Operation** *Zuzana Čarská, Vladimír Faltus, Petr Richter Vladimír Faltus (Gar.)*	Z,ZK	7	3P+2C	Z	z
12VRZ	**High Speed Rail Transport** *Lukáš Týfa Lukáš Týfa (Gar.)*	KZ	3	2P+0C	Z	z
15JBA3	**Language - English 3** *Jitka Heřmanová, Peter Morpuss, Markéta Vojanová, Marie Michlová, Marek Tomeček, Markéta Musilová, Jan Feit, Eva Rezlerová, Dana Boušová Dana Boušová (Gar.)*	Z	2	0P+2C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S-NP-DS-21/22 Name=3rd Sem. Bachelor Full-Time DS from 2021/22

11STS	Stochastic Systems	Z,ZK	4
The subject deals with the problems of mathematical modelling of dynamical systems, estimation od 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.			
12DAZP	Transport and Environment	Z,ZK	4
This course aims the impact of transport on environment. The accent is put mainly on noise and vibration, emission, barrier effect and energy demands. The noise measury is part and parcel of this course.			
12TEAP	Theory of Road Traffic Operation	Z,ZK	7
Traffic parameters and their measurement, acquisition and processing. Road capacity analysis. Theoretical foundations and applications of mathematical models - macroscopic, statistical and microscopic traffic models. Theory of traffic management. Traffic light signals, roundabouts, coordination, public transport priority. Urban and highway management. Traffic excesses management. Road assessment and maintenance methods. Health risks assessment.			
12VRZ	High Speed Rail Transport	KZ	3
High speed railway (HSR) transport characteristics and position in transportation system. Types / models of HSR systems, preparation of high speed railway lines building in the Czech Republic conditions. Non-adhesion HSR systems. City and region traffic service by HSR. HSR operating points. HSR worldwide network. HSR routing and traffic conception. Specifics of HSR track construction and layout track parameteres.			

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: 3S-NP-DS-V-21/22
Name of the group: 3rd Sem. Master Full-Time DS Alternative from 2021/22
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
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
12IDOS	**Integrated Transport Systems** *Jan Kruntorád, Martin Jareš, Petr Chmela*	ZK	3	2P+0C	Z	z
16STK	**Simulation and Testing of Vehicle Body and Systems** *Josef Svoboda, Michal Cenkner, Petr Bouchner Petr Bouchner (Gar.)*	ZK	3	2P+0C	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S-NP-DS-V-21/22 Name=3rd Sem. Master Full-Time DS Alternative from 2021/22

12IDOS	Integrated Transport Systems	ZK	3

Reasons for building of integrated transport systems, principle of integration, dividing of integration methods, traffic, infrastructure, technical, organizational methods, integration of tariff, sales systems, information systems, marketing of system, examples of non-integration.

16STK	Simulation and Testing of Vehicle Body and Systems	ZK	3

Simulation theory. Computing equipment for simulation. Modeling of mechanical and dynamic systems. Simulation and optimization methods. Hardware in the Loop (HIL). Simulation approaches for vehicle design. Simulation of propulsion and electric systems. Strength and material analyses of dynamical phenomena for vehicles of on-land carriage.

Code of the group: 4S-NP-DS-21/22
Name of the group: 4th Sem. Bachelor Full-Time DS from 2021/22
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)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
15JBA4	**Language - English 4**	ZK	2	0P+2C+10B	L	z

Characteristics of the courses of this group of Study Plan: Code=4S-NP-DS-21/22 Name=4th Sem. Bachelor Full-Time DS from 2021/22

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: XD-NP-DS-21/22
Name of the group: Thesis Master Full-Time DS from 2021/22
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)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
11XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
12XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
14XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
15XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
16XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
17XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
18XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z

20XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
21XNDD	**Master Thesis for study programme DS**	Z	18	0P+20C	L	z
22XNDD	**Master Thesis for study programme DS** ***Luboš Nouzovský***	Z	18	0P+20C	L	z
23XNDD	**Master Thesis for study programme DS** ***Zdeněk Svatý***	Z	18	0P+20C	L	z

Characteristics of the courses of this group of Study Plan: Code=XD-NP-DS-21/22 Name=Thesis Master Full-Time DS from 2021/22

11XNDD	Master Thesis for study programme DS	Z	18
12XNDD	Master Thesis for study programme DS	Z	18
14XNDD	Master Thesis for study programme DS	Z	18
15XNDD	Master Thesis for study programme DS	Z	18
16XNDD	Master Thesis for study programme DS	Z	18
17XNDD	Master Thesis for study programme DS	Z	18
18XNDD	Master Thesis for study programme DS	Z	18
20XNDD	Master Thesis for study programme DS	Z	18
21XNDD	Master Thesis for study programme DS	Z	18
22XNDD	Master Thesis for study programme DS	Z	18
23XNDD	Master Thesis for study programme DS	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: X2-NP-DS-20/21
Name of the group: Research Groups Master Full-Time DS from 2020/21
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** *Lukáš Týfa, Ondřej Trešl, Zuzana Čarská, Jan Kruntorád, Martin Jareš, Petr Chmela, Daniel Chlebek, Jakub Zajíček, Dagmar Kočárková, ...*	Z	2	0P+2C+4B	Z	ZP
14XN1	**Master Project 1**	Z	2	0P+2C+4B	Z	ZP
15XN1	**Master Project 1**	Z	2	0P+2C+4B	Z	ZP
16XN1	**Master Project 1** *Josef Mík, Přemysl Toman*	Z	2	0P+2C+4B	Z	ZP
17XN1	**Master Project 1** *Milan Kříž, Michal Drábek, Zdeněk Michl, Vít Janoš, Rudolf Vávra, Roman Štěrba, Václav Baroch, Alexandra Dvořáčková, Veronika Faifrová, ...*	Z	2	0P+2C+4B	Z	ZP
18XN1	**Master Project 1** *Daniel Kytýř, Václav Rada, Nela Krčmářová*	Z	2	0P+2C+4B	Z	ZP
20XN1	**Master Project 1** *Milan Sliacky, Jiří Růžička*	Z	2	0P+2C+4B	Z	ZP
21XN1	**Master Project 1** *Bo Stloukal, Milan Kameník, Stanislav Pleninger, Stanislav Kušmírek, Jakub Trýb, Iveta Kameníková, Jakub Kraus, Andrej Lališ, Slobodan Stojić, ...*	Z	2	0P+2C+4B	Z	ZP
22XN1	**Master Project 1** *Michal Frydrýn, Tomáš Kohout, Karel Kocián, Luboš Nouzovský, Zdeněk Svatý, Jakub Nováček*	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**	Z	2	0P+2C+8B	L	ZP
14XN2	**Master Project 2**	Z	2	0P+2C+8B	L	ZP
15XN2	**Master Project 2**	Z	2	0P+2C+8B	L	ZP
16XN2	**Master Project 2**	Z	2	0P+2C+8B	L	ZP
17XN2	**Master Project 2**	Z	2	0P+2C+8B	L	ZP
18XN2	**Master Project 2** ***Daniel Kytýř***	Z	2	0P+2C+8B	L	ZP

20XN2	**Master Project 2** ***Vladimír Faltus***	Z	2	0P+2C+8B	L	ZP
21XN2	**Master Project 2**	Z	2	0P+2C+8B	L	ZP
22XN2	**Master Project 2**	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** *Lukáš Týfa, Ondřej Trešl, Zuzana Čarská, Jan Kruntorád, Martin Jareš, Petr Chmela, Jakub Zajíček, Dagmar Kočárková, Martin Jacura, ...*	Z	1	0P+4C	Z	ZP
14XN3	**Master Project 3**	Z	1	0P+4C	Z	ZP
15XN3	**Master Project 3**	Z	1	0P+4C	Z	ZP
16XN3	**Master Project 3** *Josef Svoboda, Michal Cenkner, Josef Mík, Přemysl Toman*	Z	1	0P+4C	Z	ZP
17XN3	**Master Project 3** *Milan Kříž, Michal Drábek, Zdeněk Michl, Vít Janoš, Rudolf Vávra, Václav Baroch, Alexandra Dvořáčková, Veronika Faifrová, Eliška Glaserová, ...*	Z	1	0P+4C	Z	ZP
18XN3	**Master Project 3** *Daniel Kytýř, Nela Krčmářová, Tomáš Fíla*	Z	1	0P+4C	Z	ZP
20XN3	**Master Project 3** *Jiří Růžička, Patrik Horažďovský*	Z	1	0P+4C	Z	ZP
21XN3	**Master Project 3** *Bo Stloukal, Terézia Pilmannová, Peter Vittek, Miloš Strouhal, Ota Hajzler*	Z	1	0P+4C	Z	ZP
22XN3	**Master Project 3** *Michal Frydrýn, Tomáš Kohout, Karel Kocián, Luboš Nouzovský, Zdeněk Svatý, Tomáš Mičunek*	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**	Z	8	0P+4C	L	ZP
14XN4	**Master Project 4**	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**	Z	8	0P+4C	L	ZP
18XN4	**Master Project 4**	Z	8	0P+4C	L	ZP
20XN4	**Master Project 4** ***Patrik Horažďovský***	Z	8	0P+4C	L	ZP
21XN4	**Master Project 4**	Z	8	0P+4C	L	ZP
22XN4	**Master Project 4**	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=X2-NP-DS-20/21 Name=Research Groups Master Full-Time DS from 2020/21

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-NP-DS-24/25
Name of the group: Comp. Sel. Courses Master Full-Time DS from 2024/25
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)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
00Y2XN	**Active participation in a scientific project, workshop, short-term trip abroad** *Patrik Horažďovský Patrik Horažďovský (Gar.)*	KZ	2	2P+0C		PV
17Y2AM	**Application of Marketing Tools in Transportation**	KZ	2	2P+0C	L	PV
12Y2BM	**Safety on The Local Roads**	KZ	2	2P+0C	Z	PV
14Y2C1	**CATIA I**	KZ	2	2P+0C	L	PV
14Y2C2	**CATIA II**	KZ	2	2P+0C	Z	PV
14Y2CS	**Sensitivity of Systems**	KZ	2	2P+0C	L	PV
21Y2CR	**CRM**	KZ	2	2P+0C+8B	L	PV
12Y2DU	**Transport in the Context of Sustainability**	KZ	2	2P+0C	L	PV
15Y2DN	**Transportation Psychology in German Speaking Countries**	KZ	2	2P+0C	L	PV
18Y2DC	**Dynamics of Transport Routes and Vehicles**	KZ	2	2P+0C	Z	PV
18Y2EM	**Electron microscopy**	KZ	2	2P+0C	L	PV
16Y2EE	**Emissions and Ergonomics of Vehicles**	KZ	2	2P+0C	L	PV
17Y2FM	**Financing in Urban Mass Transportation**	KZ	2	2P+0C	Z	PV
21Y2FM	**Aviation Company Financial Management**	KZ	2	2P+0C+8B	Z	PV
18Y2FZ	**Physical foundation of materials' properties**	KZ	2	2P+0C	L	PV
15Y2HS	**Road Transport History**	KZ	2	2P+0C	L	PV
16Y2HP	**Vehicle Hygiene**	KZ	2	2P+0C	L	PV
14Y2IS	**Intelligent Systems in Postal Services**	KZ	2	2P+0C	L	PV
12Y2IS	**Urban Networks**	KZ	2	2P+0C	Z	PV
14Y2JM	**One-Chip Controllers**	KZ	2	2P+0C	Z	PV
15Y2JH	**Job Hunting in English** *Lenka Monková Lenka Monková (Gar.)*	KZ	2	2P+0C	Z	PV

14Y2KI	**Capital Investment in Transportation and Telecommunications**	KZ	2	2P+0C	L	PV
16Y2KV	**Car Body Design**	KZ	2	2P+0C	L	PV
12Y2KS	**Rail Transport in Settlements and Regions** *Miroslav Veliš Miroslav Veliš (Gar.)*	KZ	2	2P+0C	Z	PV
12Y2KE	**Landscape Ecology**	KZ	2	2P+0C	Z	PV
11Y2LG	**Logics of Engineer's Judgement**	KZ	2	2P+0C+8B	L	PV
21Y2MQ	**Quality Management**	KZ	2	2P+0C+8B	L	PV
15Y2MS	**Sociology for Managers** *Martina Šmidochová Martina Šmidochová (Gar.)*	KZ	2	2P+0C	Z	PV
21Y2MK	**Marketing of Air Transport** *Peter Vittek* ***Peter Vittek*** *Peter Vittek (Gar.)*	KZ	2	2P+0C+8B	Z	PV
12Y2MH	**Measurement and Modeling of Traffic Noise**	KZ	2	2P+0C	L	PV
12Y2MI	**Urban Engineering**	KZ	2	2P+0C	L	PV
18Y2MP	**Finite Element Method And Its Application**	KZ	2	2P+0C	L	PV
16Y2MK	**Quality Methods for Vehicles**	KZ	2	2P+0C	L	PV
12Y2MD	**Methods of Traffic Regulation and Prediction**	KZ	2	2P+0C	L	PV
17Y2MO	**International Organisations in Transportation**	KZ	2	2P+0C	L	PV
17Y2MS	**Microsimulation of Railway Operation** *Zdeněk Michl Zdeněk Michl (Gar.)*	KZ	2	2P+0C	Z	PV
17Y2MD	**Modelling and optimization on transport networks**	KZ	2	2P+0C	Z	PV
21Y2MC	**CNS Systems Modelling** *Stanislav Pleninger* ***Stanislav Pleninger*** *Stanislav Pleninger (Gar.)*	KZ	2	2P+0C+8B	Z	PV
17Y2MT	**Modern History for Engineering Students** *Rudolf Franz Heidu* ***Rudolf Franz Heidu*** *Petra Skolilová (Gar.)*	KZ	2	2P+0C	Z	PV
21Y2MG	**Military Aerospace Technologies: Applications and Global Dynamics** *Sarah Van Den Bergh Sarah Van Den Bergh (Gar.)*	KZ	2	2P+0C+8B	Z	PV
12Y2MZ	**Modernization of Railway Lines and Stations**	KZ	2	2P+0C	L	PV
12Y2NS	**Shared Space Design** *Vojtěch Novotný, Karel Hájek Karel Hájek (Gar.)*	KZ	2	2P+0C	Z	PV
14Y2OP	**Object Oriented Programming in Transport**	KZ	2	2P+0C	L	PV
15Y2OZ	**Health Protection in Transportation and EU** *Petr Musil Petr Musil (Gar.)*	KZ	2	2P+0C	Z	PV
15Y2OF	**Specialised French for Transportation and Telecommunications**	KZ	2	2P+0C	Z	PV
18Y2OB	**Optical Contactless Strain Measurements**	KZ	2	2P+0C	L	PV
16Y2PG	**Computer Graphics and Virtual Reality**	KZ	2	2P+0C	Z	PV
22Y2PS	**Traffic Accidents Computer Simulation and Analysis** ***Tomáš Mičunek***	KZ	2	2P+0C	L	PV
15Y2PT	**Food in Transportation**	KZ	2	2P+0C	L	PV
15Y2PD	**Practical Spanish for Transportation**	KZ	2	2P+0C	Z	PV
21Y2PP	**Law and Operation in Air Transport**	KZ	2	2P+0C+8B	L	PV
20Y2PR	**Prediction of time series**	KZ	2	2P+0C	L	PV
12Y2PV	**Public transport priority**	KZ	2	2P+0C	L	PV
14Y2PI	**Process Information Systems in Transportation**	KZ	2	2P+0C	Z	PV
14Y2PJ	**C++ Programming Language**	KZ	2	2P+0C	L	PV
14Y2PH	**CAD Interface Programming**	KZ	2	2P+0C	L	PV
11Y2PM	**Programming in MATLAB** ***Šárka Voráčová***	KZ	2	2P+0C	L	PV
15Y2PU	**Publications and Their Creation**	KZ	2	2P+0C	Z	PV
12Y2RD	**Realization of Transport Buildings**	KZ	2	2P+0C	L	PV
15Y2SP	**Seminar on Political Philosophy** *Marek Tomeček Marek Tomeček (Gar.)*	KZ	2	2P+0C	Z	PV
17Y2SJ	**Network Timetabling on the Railway**	KZ	2	2P+0C	L	PV
16Y2ST	**Special Technologies in Transport and Telecommunications**	KZ	2	2P+0C	L	PV
16Y2SV	**Special technologies in vehicle manufacturing**	KZ	2	2P+0C	L	PV
18Y2SD	**Reliability and Diagnostics, Experimental Methods** *Daniel Kytýř* ***Daniel Kytýř*** *Daniel Kytýř (Gar.)*	KZ	2	2P+0C	Z	PV
15Y2SR	**Stylistics and Rhetorics**	KZ	2	2P+0C	Z	PV
15Y2TS	**Technician and Contemporary Society**	KZ	2	2P+0C	L	PV
20Y2TE	**Technology of Electronic Systems**	KZ	2	2P+0C	Z	PV

14Y2TU	**Telecommunications Systems and Multimedia**	KZ	2	2P+0C	Z	PV
16Y2TT	**Transportation and Building Technology and Equipment**	KZ	2	2P+0C	Z	PV
21Y2UL	**Aircraft Maintenance**	KZ	2	2P+0C+8B	L	PV
14Y2UI	**Artificial Intelligence**	KZ	2	2P+0C+8B	Z,L	PV
18Y2UB	**Accident Biomechanics and Safety**	KZ	2	2P+0C	L	PV
18Y2VC	**Computational Mechanics in Transportation**	KZ	2	2P+0C	L	PV
15Y2ZA	**Basic Principles of English Academic Writing and Abstract in English** *Dana Boušová Dana Boušová (Gar.)*	KZ	2	2P+0C	Z	PV
12Y2ZK	**Traffic Calming** *Zuzana Čarská Zuzana Čarská (Gar.)*	KZ	2	2P+0C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=Y2-NP-DS-24/25 Name=Comp. Sel. Courses Master Full-Time DS from 2024/25

00Y2XN	Active participation in a scientific project, workshop, short-term trip abroad	KZ	2
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 looses. 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.			
14Y2C1	CATIA I	KZ	2
Fundaments of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric stucture, 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, comunications 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.			
21Y2CR	CRM	KZ	2
Introduction to CRM. Analysis of air accidents. Human factor. Error. Historical development of CRM. Health and fitness. Stress and its effect on the human body. Fatigue Sleep & Vigilance. Information Processing. Situational Awareness. Workload Management. Decision Making. Communication. Leadership & Team Behaviour. Automation.			
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.			
18Y2EM	Electron microscopy	KZ	2
Basic principles of electron microscopy, construction, control and maintenance of SEM, sample preparation, signal detection, types of detectors and data evaluation using image analysis, quantification of results and automation of data processing, energy dispersive X-ray microanalysis and other analytical methods in electron microscopy. Evaluation of data obtained from ED detector, practical examples of ED microanalysis on samples.			
16Y2EE	Emissions and Ergonomics of Vehicles	KZ	2
Emissions and ergonomy 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.			
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.			
21Y2FM	Aviation Company Financial Management	KZ	2
Theories of corporate finance - financial statements, budget, forecast. Financial policy of the company. Financial resources - long-term financial resources, depreciation, retained earnings, shares, bonds, loans, leasing, capital. Financial and economic analysis of the company - structure and content.			
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 mediveal 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.			
16Y2HP	Vehicle Hygiene	KZ	2
Emissions and ergonomy 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.			

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 / utillities, metodology 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 desicion 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.			
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.			
21Y2MQ	Quality Management	KZ	2
History, basic definition. Pioneers in the field of quality. International quality organisations and quality promotion in the Czech Republic. Quality management system. Environmental management systems. Integrated management systems. Risk management in the context of the requirements of ISO standards. Sectoral quality management systems. Comprehensive quality management, excellence models and corporate social responsibility. Quality audits.			
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.			
21Y2MK	Marketing of Air Transport	KZ	2
The content of the course "Marketing in air transport" is the management of activities and processes using available marketing tools and processes for analysis, strategy development and implementation of sales of goods and services in the aviation industry. In addition to the theoretical foundations of marketing, the lectures present systems of market, competition and product analysis, creation of marketing strategies and planning.			
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 aming on utilities storage in area, coordination engineering activities in area, arrangement of public space, concepement 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.			
17Y2MD	Modelling and optimization on transport networks	KZ	2
Coordination problems on public transport networks, scheduling vehicles, design of control plans for light-controlled intersections including green wave modelling, service systems, modelling of advanced problems in distribution systems - exact, heuristic and metaheuristic principles of solving problems.			
21Y2MC	CNS Systems Modelling	KZ	2
The course is designed as a set of model tasks in the field of communication navigation and surveillance systems in aviation, addressed using mathematical approaches and software tools. A large part is devoted to air targets tracking, measurement-to-track association, track filtering and multisensor tracking.			
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.			
21Y2MG	Military Aerospace Technologies: Applications and Global Dynamics	KZ	2

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 tranzit corridors.			
12Y2NS	Shared Space Design	KZ	2
Introducing students to the concept of integrated use of public spaces by sharing space with all users. Active promotion of settlements and sustainable mobility in the public space of towns and cities. Analysis of implemented foreign examples, principles of zone design in the context of legal and technical requirements. Linking traffic engineering, urban planning and architecture in the process of designing quality public spaces.			
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 wil be chosen from microscopic simulation system, discrete event simulation, celular 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 passangers, 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.			
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.			
12Y2PV	Public transport priority	KZ	2
Public transport as the backbone of sustainable mobility. Public transport priority (PTP) in strategic documents. PTP in the Czech Republic and abroad. Types of PTP measures. Design of PTP measures. Relationship between Basics of public transport stops and stations design. PTP measures and evaluation of their operation. Economic and enviromental effects of PTP. The process of preparing PTP measures.			
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). Inforamtion 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.			
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.			
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.			
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, meassuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologiesusers 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, provissioning 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).			
21Y2UL	Aircraft Maintenance	KZ	2
Approved Maintenance Organisations (AMOs), Continuing Airworthiness Management Organisations (CAMOs), Maintenance Training Organisations (MTOs), technical documentation and additional ICA (Instructions for Continued Airworthiness) instructions, aircraft release to service procedure, maintenance programmes and scheduling, modifications and general repair methods, aircraft centre of gravity and weights, human factors in aircraft maintenance.			
14Y2UI	Artificial Intelligence	KZ	2
History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning.			
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 transportational systems. Elastic, elastoplastic and viscoelastic material. FEM in problems of biomechanics. Numerical analysis of structural parts with programme ANSYS on instances.			
15Y2ZA	Basic Principles of English Academic Writing and Abstract in English	KZ	2
Theory, creating a phrasal bank according to students' specialisations, rhetorical analysis or texts/abstracts, drafting an abstract, providing effective feedback.			
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.			

Name of the block: Elective courses
Minimal number of credits of the block: 0
The role of the block: V

Code of the group: VP-NP-DS
Name of the group: Master Full-Time DS voluntary
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
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
15JCZ1	**Czech Language for Foreign Students 1** *Irena Veselková*	Z	0	0P+2C	Z	v
15JCZ2	**Czech Language for Foreign Students 2**	Z	0	0P+2C	L	v
15JCZ3	**Czech Language for Foreign Students 3** *Irena Veselková*	Z		0P+2C	Z	v
15JCZ4	**Czech Language for Foreign Students 4**	Z		0P+2C	L	v

Characteristics of the courses of this group of Study Plan: Code=VP-NP-DS Name=Master Full-Time DS voluntary

15JCZ1	Czech Language for Foreign Students 1	Z	0
Basic structures of Czech language, common communication situations, study, work, leisure time activities, introduction of myself, phonetics of Czech language, writing skills.			
15JCZ2	Czech Language for Foreign Students 2	Z	0
Basic structures of Czech language, common communication situations, study, work, leisure time activities, introduction of myself, phonetics of Czech language, writing skills.			
15JCZ3	Czech Language for Foreign Students 3	Z	
Language structures with regard to the group level. Listening and oral fluency drill. Basic terminology.			

15JCZ4	Czech Language for Foreign Students 4	Z	
Language structures with regard to the group level. Listening and oral fluency drill. Basic terminology.			

Name of the block: Jazyky
Minimal number of credits of the block: 8
The role of the block: J

Code of the group: JZ-NP-DS-20/21
Name of the group: Language Courses Master Full-Time DS from 2020/21
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)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
15J2F1	**Language - French 1** *Irena Veselková*	Z	2	0P+2C+10B	Z	J
15J2I1	**Language - Italian 1** *Irena Veselková*	Z	2	0P+2C+10B	Z	J
15J2N1	**Language - German 1** *Eva Rezlerová, Martina Navrátilová, Jana Štikarová*	Z	2	0P+2C+10B	Z	J
15J2R1	**Language - Russian 1** *Marie Michlová **Marie Michlová** Marie Michlová (Gar.)*	Z	2	0P+2C+10B	Z	J
15J2S1	**Language - Spanish 1** *Zuzana Krinková, Nina Hricsina Puškinová Zuzana Krinková (Gar.)*	Z	2	0P+2C+10B	Z	J
15JBF2	**Language - French 2**	Z	2	0P+2C+10B	L	J
15JBI2	**Language - Italian 2**	Z	2	0P+2C+10B	L	J
15JBN2	**Language - German 2**	Z	2	0P+2C+10B	L	J
15JBR2	**Language - Russian 2**	Z	2	0P+2C+10B	L	J
15JBS2	**Language - Spanish 2**	Z	2	0P+2C+10B	L	J
15JBF3	**Language - French 3** *Irena Veselková*	Z	2	0P+2C+10B	Z	J
15JBI3	**Language - Italian 3** *Irena Veselková*	Z	2	0P+2C+10B	Z	J
15JBN3	**Language - German 3** *Eva Rezlerová, Martina Navrátilová, Jana Štikarová*	Z	2	0P+2C+10B	Z	J
15JBR3	**Language - Russian 3** *Marie Michlová **Marie Michlová** Marie Michlová (Gar.)*	Z	2	0P+2C+10B	Z	J
15JBS3	**Language - Spanish 3** *Zuzana Krinková Zuzana Krinková (Gar.)*	Z	2	0P+2C+10B	Z	J
15JBF4	**Language - French 4**	ZK	2	0P+2C+10B	L	J
15JBI4	**Language - Italian 4**	ZK	2	0P+2C+10B	L	J
15JBN4	**Language - German 4**	ZK	2	0P+2C+10B	L	J
15JBR4	**Language - Russian 4**	ZK	2	0P+2C+10B	L	J
15JBS4	**Language - Spanish 4**	ZK	2	0P+2C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-NP-DS-20/21 Name=Language Courses Master Full-Time DS from 2020/21

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
00Y2XN	Active participation in a scientific project, workshop, short-term trip abroad	KZ	2
11STS	Stochastic Systems	Z,ZK	4
The subject deals with the problems of mathematical modelling of dynamical systems, estimation od 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.			
11XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2
11XN3	Master Project 3	Z	1
11XN4	Master Project 4	Z	8
11XNDD	Master Thesis for study programme DS	Z	18
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.			
12BED	Road Safety Audit	Z,ZK	4
Schedules of applications of safety assessments (especially Road Safety Audit, Road Safety Inspection) during the process of preparations, and of the particular realization of the road network that should minimize traffic accident risks for all those who take part in road traffic. Application of European Directive 2008/96/EC on road safety infrastructure management.			
12DAZP	Transport and Environment	Z,ZK	4
This course aims the impact of transport on environment. The accent is put mainly on noise and vibration, emission, barrier effect and energy demands. The noise measury is part and parcel of this course.			
12IDOS	Integrated Transport Systems	ZK	3
Reasons for building of integrated transport systems, principle of integration, dividing of integration methods, traffic, infrastructure, technical, organizational methods, integration of tariff, sales systems, information systems, marketing of system, examples of non-integration.			
12IKD	Rail Transport Infrastructure	Z,ZK	5
Non-compensated lateral acceleration, parameters eduction for transition curve and cant transition, curves without straight, track spacing change. Track detailed construction. Substructure design, slab track. Tram-train. Interoperability. Noise precautions. Railway line modernization for non-tilting and tilting trains.			
12NAPI	Design and Maintenance of Transportation Structures	Z,ZK	4
Design and construction of cement-concrete pavements and their maintenance. Construction of bridge objects, examples and choice of bridge construction materials. Construction and operation of tunnels.			
12TEAP	Theory of Road Traffic Operation	Z,ZK	7
Traffic parameters and their measurement, acquisition and processing. Road capacity analysis. Theoretical foundations and applications of mathematical models - macroscopic, statistical and microscopic traffic models. Theory of traffic management. Traffic light signals, roundabouts, coordination, public transport priority. Urban and highway management. Traffic excesses management. Road assessment and maintenance methods. Health risks assessment.			
12TKVP	Highway Engineering Materials	Z,ZK	4
The theory of road construction - Material Aspects. The course emphasizes the development of road construction from the beginning of the 20th century to the present, focusing on materials, understanding the production and placing of asphalt mixtures.			
12UMUP	Sustainable Mobility and Land - Use Planning	Z,ZK	5
Spatial planning - objectives and tasks, development over time. Land-use planning tools. SUMP. Territorial and transport planning context. Ways of urban growth in connection with transport. Basic principles of the transport solution. The impact of transport on the size and shape of the city, on the development of the street and the square and the roads. Solutions for pedestrian and bicycle transport. Suburbanization and transport. City economics.			
12VRZ	High Speed Rail Transport	KZ	3
High speed railway (HSR) transport characteristics and position in transportation system. Types / models of HSR systems, preparation of high speed railway lines building in the Czech Republic conditions. Non-adhesion HSR systems. City and region traffic service by HSR. HSR operating points. HSR worldwide network. HSR routing and traffic conception. Specifics of HSR track construction and layout track parameteres.			
12XN1	Master Project 1	Z	2
12XN2	Master Project 2	Z	2
12XN3	Master Project 3	Z	1
12XN4	Master Project 4	Z	8
12XNDD	Master Thesis for study programme DS	Z	18
12Y2BM	Safety on The Local Roads	KZ	2
Classification of road accidents rates, social looses. 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 / utillities, metodology 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 aming on utilities storage in area, coordination engineering activities in area, arrangement of public space, concepement 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 tranzit corridors.			
12Y2NS	Shared Space Design	KZ	2
Introducing students to the concept of integrated use of public spaces by sharing space with all users. Active promotion of settlements and sustainable mobility in the public space of towns and cities. Analysis of implemented foreign examples, principles of zone design in the context of legal and technical requirements. Linking traffic engineering, urban planning and architecture in the process of designing quality public spaces.			
12Y2PV	Public transport priority	KZ	2
Public transport as the backbone of sustainable mobility. Public transport priority (PTP) in strategic documents. PTP in the Czech Republic and abroad. Types of PTP measures. Design of PTP measures. Relationship between Basics of public transport stops and stations design. PTP measures and evaluation of their operation. Economic and enviromental effects of PTP. The process of preparing PTP measures.			
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.			
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.			
12ZSUZ	Railway Stations and Centres	Z,ZK	3
Equipment for passenger transport. Platform construction. Access roads to platforms. Modification of railway stations according to the TSI PRM. Station heads design. Variant solutions of station heads for current ride. Junction stations. Crossing stations. Passenger stations. Moving stations. Public transport terminals.			
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
14XNDD	Master Thesis for study programme DS	Z	18
14Y2C1	CATIA I	KZ	2
Fundaments of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric stucture, 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, comunications 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 desicion making - long term goals and investment strategies, long term financing			
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 wil be chosen from microscopic simulation system, discrete event simulation, celular 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). Inforamtion 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, provissioning 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.			
15JCZ1	Czech Language for Foreign Students 1	Z	0
Basic structures of Czech language, common communication situations, study, work, leisure time activities, introduction of myself, phonetics of Czech language, writing skills.			
15JCZ2	Czech Language for Foreign Students 2	Z	0
Basic structures of Czech language, common communication situations, study, work, leisure time activities, introduction of myself, phonetics of Czech language, writing skills.			
15JCZ3	Czech Language for Foreign Students 3	Z	
Language structures with regard to the group level. Listening and oral fluency drill. Basic terminology.			
15JCZ4	Czech Language for Foreign Students 4	Z	
Language structures with regard to the group level. Listening and oral fluency drill. Basic terminology.			
15XN1	Master Project 1	Z	2
15XN2	Master Project 2	Z	2
15XN3	Master Project 3	Z	1
15XN4	Master Project 4	Z	8
15XNDD	Master Thesis for study programme DS	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 mediveal 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	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.			
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.			
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.			
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.			
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.			
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.			
15Y2SP	Seminar on Political Philosophy	KZ	2
Interpreting of philosophical texts, view of society, state and their system of government.			
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.			

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?			
15Y2ZA	Basic Principles of English Academic Writing and Abstract in English	KZ	2
Theory, creating a phrasal bank according to students' specialisations, rhetorical analysis or texts/abstracts, drafting an abstract, providing effective feedback.			
16PDP	Principles of Vehicle Design	ZK	2
Design of transportation vehicle according to its usage and function. Marketing and user demands. Vehicle dynamics. Propulsion systems. Design process, functional design and vehicle structure. Evaluation of variant concepts. Design phases. Realiability, technological aspects etc.			
16STK	Simulation and Testing of Vehicle Body and Systems	ZK	3
Simulation theory. Computing equipment for simulation. Modeling of mechanical and dynamic systems. Simulation and optimization methods. Hardware in the Loop (HIL). Simulation approaches for vehicle design. Simulation of propulsion and electric systems. Strength and material analyses of dynamical phenomena for vehicles of on-land carriage.			
16XN1	Master Project 1	Z	2
16XN2	Master Project 2	Z	2
16XN3	Master Project 3	Z	1
16XN4	Master Project 4	Z	8
16XNDD	Master Thesis for study programme DS	Z	18
16Y2EE	Emissions and Ergonomics of Vehicles	KZ	2
Emissions and ergonomy 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.			
16Y2HP	Vehicle Hygiene	KZ	2
Emissions and ergonomy 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.			
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.			
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.			
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).			
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.			
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).			
17DOPD	Transportation Planning and Modeling	Z,ZK	4
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.			
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.			
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	Z	2
17XN3	Master Project 3	Z	1
17XN4	Master Project 4	Z	8
17XNDD	Master Thesis for study programme DS	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.			
17Y2MD	Modelling and optimization on transport networks	KZ	2
Coordination problems on public transport networks, scheduling vehicles, design of control plans for light-controlled intersections including green wave modelling, service systems, modelling of advanced problems in distribution systems - exact, heuristic and metaheuristic principles of solving problems.			
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.			
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.			
18GAZ	Geomechanics and Foundation Engineering	Z,ZK	3
Geology (basics of pertrographyand stratigraphy), mechanics of soils (classification of fundamental soils, mechanic properties of fundamental soils, permeability), planar foundations (footings, footers, plates, depth of founding), determination of planar foundations bearing and deformation, depth foundations classification of depth foundations elements, examples of their use, piles (classification, technology od performing).			
18TEAM	Theoretical and Applied Mechanics	Z,ZK	4
Fundamentals of theory of plasticity. Plasticity conditions. Elastoplastic and plastic states of cross-sections and beams. Reliability and durability of structures. The stress and strain state around a notch. Stress intensity factor. Fracture toughness. Energy methods of linear fracture mechanics. Crack driving force.			
18TIK	Theory of Engineering Structures	Z,ZK	4
The course builds upon the knowledge gained in basic mechanics courses in bachelor study (especially Statics and Elasticity) in the field of mathematical theory of elasticity. Emphasis is placed on plane and axisymmetric problems, as well as on the calculation of stress and strain in plates and shells. Students are further acquainted with methods of modeling the behavior of subsoil used in the design of line structures.			
18XN1	Master Project 1	Z	2
18XN2	Master Project 2	Z	2
18XN3	Master Project 3	Z	1
18XN4	Master Project 4	Z	8
18XNDD	Master Thesis for study programme DS	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.			
18Y2EM	Electron microscopy	KZ	2
Basic principles of electron microscopy, construction, control and maintenance of SEM, sample preparation, signal detection, types of detectors and data evaluation using image analysis, quantification of results and automation of data processing, energy dispersive X-ray microanalysis and other analytical methods in electron microscopy. Evaluation of data obtained from ED detector, practical examples of ED microanalysis on samples.			
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 transportational 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
20XNDD	Master Thesis for study programme DS	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, meassuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologiesusers and operators.			
21XN1	Master Project 1	Z	2

21XN2	Master Project 2	Z	2
21XN3	Master Project 3	Z	1
21XN4	Master Project 4	Z	8
21XNDD	Master Thesis for study programme DS	Z	18
21Y2CR	CRM	KZ	2
Introduction to CRM. Analysis of air accidents. Human factor. Error. Historical development of CRM. Health and fitness. Stress and its effect on the human body. Fatigue Sleep & Vigilance. Information Processing. Situational Awareness. Workload Management. Decision Making. Communication. Leadership & Team Behaviour. Automation.			
21Y2FM	Aviation Company Financial Management	KZ	2
Theories of corporate finance - financial statements, budget, forecast. Financial policy of the company. Financial resources - long-term financial resources, depreciation, retained earnings, shares, bonds, loans, leasing, capital. Financial and economic analysis of the company - structure and content.			
21Y2MC	CNS Systems Modelling	KZ	2
The course is designed as a set of model tasks in the field of communication navigation and surveillance systems in aviation, addressed using mathematical approaches and software tools. A large part is devoted to air targets tracking, measurement-to-track association, track filtering and multisensor tracking.			
21Y2MG	Military Aerospace Technologies: Applications and Global Dynamics	KZ	2
21Y2MK	Marketing of Air Transport	KZ	2
The content of the course "Marketing in air transport" is the management of activities and processes using available marketing tools and processes for analysis, strategy development and implementation of sales of goods and services in the aviation industry. In addition to the theoretical foundations of marketing, the lectures present systems of market, competition and product analysis, creation of marketing strategies and planning.			
21Y2MQ	Quality Management	KZ	2
History, basic definition. Pioneers in the field of quality. International quality organisations and quality promotion in the Czech Republic. Quality management system. Environmental management systems. Integrated management systems. Risk management in the context of the requirements of ISO standards. Sectoral quality management systems. Comprehensive quality management, excellence models and corporate social responsibility. Quality audits.			
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.			
21Y2UL	Aircraft Maintenance	KZ	2
Approved Maintenance Organisations (AMOs), Continuing Airworthiness Management Organisations (CAMOs), Maintenance Training Organisations (MTOs), technical documentation and additional ICA (Instructions for Continued Airworthiness) instructions, aircraft release to service procedure, maintenance programmes and scheduling, modifications and general repair methods, aircraft centre of gravity and weights, human factors in aircraft maintenance.			
22AMMD	Measuring Methods Applied to Transportation	KZ	4
Geodetic location and technical processing of traffic route with geodetic total station, GPS and photogrammetry, 3D scanning. Transport corridor setting out using geodetic methods. Detection and technical processing of several vehicle dynamic characteristics using high-speed cameras and accelerometers. It is a week course and the terms are usually set in June and September - usually in examination period.			
22MSV	Modelling and Vehicle Movement Simulation	KZ	2
Principles and posibilities of simulation tools with regards to vehicle movement analysis and vehicle crash analysis. Kinematic and dynamic modelling of vehicle/set of vehicles movement. View conditions. Proposed road space passage. Processing of road 3D models.			
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22XN3	Master Project 3	Z	1
22XN4	Master Project 4	Z	8
22XNDD	Master Thesis for study programme DS	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 passangers, 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
23XNDD	Master Thesis for study programme DS	Z	18

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