Study plan

Name of study plan: PRE bak. studium od 22-23 (skok do 3. r. oboru DOS) - program B3710

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Technology in Transportation and Telecommunications Type of study: Bachelor full-time Required credits: 180 Elective courses credits: 0 Sum of credits in the plan: 180 Note on the plan:

Name of the block: Compulsory courses Minimal number of credits of the block: 160 The role of the block: Z

Code of the group: 1S PRE 22-23 P Name of the group: 1. sem. bak. PRE 22-23 povinné p edm ty (spol. ást studia) - pro B3710 Requirement credits in the group: In this group you have to gain 30 credits Requirement courses in the group: In this group you have to complete 11 courses Credits in the group: 30 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
611CAL1	Calculus 1 Romana Zibnerová Ond ej Navrátil (Gar.)	Z,ZK	7	2P+4C+22E	B Z	Z
611LA	Linear Algebra Romana Zibnerová Romana Zibnerová Martina Be vá ová (Gar.)	Z,ZK	3	2P+1C+10E	B Z	Z
612ZYDI	Introduction to Transportation Engineering Dagmar Ko árková Dagmar Ko árková (Gar.)	Z,ZK	2	1P+1C	Z	Z
618MTY	Materials Science and Engineering Vít Malinovský Jaroslav Valach (Gar.)	Z,ZK	3	2P+1C+10E	B Z	Z
611GIE	Geometry Vít Malinovský Šárka Vorá ová (Gar.)	KZ	3	2P+2C+12E	3 Z	Z
614ASD	Algorithm and Data Structures Jan Mejst ík	KZ	3	0P+2C+8E	3 Z	Z
614KSP	Constructing with Computer Aid	KZ	2	0P+2C+8E	3 Z	Z
618TED	Technical Documentation Vít Malinovský Jitka ezní ková (Gar.)	KZ	2	1P+1C+8E	3 Z	Z
615DPLG	Transportation Psychology Jana Štikarová	Z	2	2P+0C+6E	3 Z	Z
616UDOP	Introduction into Vehicles Zuzana Radová Petr Bouchner (Gar.)	Z	2	2P+0C+8E	3 Z	Z
TV-1	Physical Education	Z	1		Z	Z

Characteristics of the courses of this group of Study Plan: Code=1S PRE 22-23 P Name=1. sem. bak. PRE 22-23 povinné p edm ty (spol. ást studia) - pro B3710

611CAL1	Calculus 1	Z,ZK	7				
Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Euklidean space and							
Cartesian coordinate sy	stem. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several rea	l variables.					
611LA	611LA Linear Algebra Z,ZK 3						
Vector spaces (linear co	mbinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and	their solvability. D	eterminants and				
their applications. Scala	r product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.						
612ZYDI	512ZYDI Introduction to Transportation Engineering Z,ZK 2						
Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative							
impacts of transportation	mpacts of transportation to environment and safety.						

618MTY	Materials Science and Engineering	Z,ZK	3
Basic course of materia	Is science and engineering explains mechanical properties of structural materials based on their bonding forces and microstru	ucture. However th	e main attention
is paid to metals as the	most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and	composites. Atter	tion is also paid
to degradation process	es in materials, to defectoscopy and to main mechanical tests.		
611GIE	Geometry	KZ	3
Orthographic and oblig	e projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - para	meterization, arc	of the curve,
torsion and curvature, F	Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a c	urved path.	
614ASD	Algorithm and Data Structures	KZ	3
Students will be familiar	zed with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will and	lyze problems, pro	pose theoretical
solutions to the set task	and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart	and use the basic	s of Boolean
algebra with forming the	e conditions for the algorithms.		
614KSP	Constructing with Computer Aid	KZ	2
"CAD systems" term de	termination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common	work rules in grap	hic applications
and CA systems. Co-or	dinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting poss	ibilites, AutoCAD	environment
profiles, drawings with	aster foundaments).		
618TED	Technical Documentation	KZ	2
Technical standards, in	ernational standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimension	al and geometric	al accuracy,
arrangement of drawing	j sheets.		
615DPLG	Transportation Psychology	Z	2
Subject of psychology a	nd its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle of	onstruction. Psych	ological aspects
of travel route and traffi	c conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport of	operation.	
616UDOP	Introduction into Vehicles	Z	2
Vehicles and transporta	tion systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and w	ater transport. Alt	ernative means
of transport. Lifting equ	pment and conveyors. Legislation.		
TV-1	Physical Education	Z	1
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Code of the group: 2S PRE 22-23 P

Name of the group: 2. sem. bak. PRE 22-23 povinné p edm ty (spol. ást studia) - pro B3710 Requirement credits in the group: In this group you have to gain 30 credits

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

Credits in the group: 30

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
611CAL2	Calculus 2 Romana Zibnerová Romana Zibnerová Ond ej Navrátil (Gar.)	Z,ZK	5	2P+3C+20E	L	Z
611STAT	Statistics Pavel Provinský, Pavla Pecherková Pavla Pecherková Pavel Provinský (Gar.)	Z,ZK	4	2P+2C+12E	L	Z
612ZTS	Railway Lines and Stations Tomáš Javo ík, Ond ej Trešl	Z,ZK	4	2P+2C+10E	L	Z
618SAT	Structural Analysis Tomáš Doktor Daniel Kytý (Gar.)	Z,ZK	4	2P+2C+14E	6 L	Z
620SYSA	Systems Analysis Petr Bureš, Ji í R ži ka Zuzana B linová (Gar.)	Z,ZK	5	2P+2C+14E	L	Z
614PRG	Programming Libor Žídek	KZ	2	0P+2C+8E	6 L	Z
617TEDL	Transport Technology and Logistics Michal Drábek Vít Janoš (Gar.)	KZ	3	2P+1C	L	Z
621ZALD	Basics of Air Transport Jakub Hospodka	KZ	2	0P+2C+8E	L	Z
TV-2	Physical Education	Z	1		L	Z

Characteristics of the courses of this group of Study Plan: Code=2S PRE 22-23 P Name=2. sem. bak. PRE 22-23 povinné p edm ty (spol. ást studia) - pro B3710

611CAL2	Calculus 2	Z,ZK	5				
Antiderivative, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Parametric description of regular							
k-dimensional surfaces	in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary d	lifferential equatio	ns of the first				
order, linear differential	equations with constant coefficients and its systems.						
611STAT	611STAT Statistics Z,ZK 4						
Definition of probability,	random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation	on. Testing of statis	stical hypothesis.				
Regression and correlation	tion, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linea	ar regression, ana	lysis of variance,				
multiple regression, the	use of matrices in regression.						
612ZTS	Railway Lines and Stations	Z,ZK	4				
Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines.							
Railway control systems	s in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.						

618SAT	Structural Analysis	Z,ZK	4				
General system of force	as in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determine	, ,	nple girders.				
Principle of virtual work.	Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction	ons. Cross-section	al characteristics				
of planar shapes. Fiber	of planar shapes. Fiber polygons and chains.						
620SYSA	Systems Analysis	Z,ZK	5				
Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour							
and its analysis, strong	functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision t	ables, algorithms	for structural				
tasks. Soft and hard sys	stems, methods for soft system analysis.						
614PRG	Programming	KZ	2				
Algorithm development	, methods of structured programming, high-level programming languages, basics of C programming languages (types, variab	les, conditions, cy	cles, arrays,				
functions), programmin	g techniques, complexity.						
617TEDL	Transport Technology and Logistics	KZ	3				
Basic terms in transpor	t technology and logistics, particular steps of transport planning, line planning, timetabling, planning in pasanger and freight t	, transport, organis	ation of traffic in				
each transport modus,	technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their aplication u	ising various trans	sport modus.				
621ZALD	Basics of Air Transport	KZ	2				
History, definitions, term	inology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigat	ion. Weight, balan	ce, performance.				
Flight planning, optimiz	Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew.						
Airlines and economics	. Space technologies.						
TV-2	Physical Education	Z	1				

Code of the group: 3S PRE 22-23 P Name of the group: 3. sem. bak. PRE 22-23 povinné p edm ty (S S) - B3710 Requirement credits in the group: In this group you have to gain 30 credits Requirement courses in the group: In this group you have to complete 8 courses Credits in the group: 30 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
611FYZ	Physics Goce Chadzitaskos Zuzana Malá (Gar.)	Z,ZK	5	2P+2C+18B	Z	Z
612MDE	Transport Models and Transport Excesses Josef Kocourek, Tomáš Pad lek Josef Kocourek (Gar.)	Z,ZK	3	2P+1C+8B	Z	Z
617TGA	Graph Theory and its Applications in Transport Alexandra Dvo á ková Denisa Mocková (Gar.)	Z,ZK	4	2P+2C+12B	Z	Z
618PZP	Elasticity and Strength Tomáš Doktor Ond ej Jiroušek (Gar.)	Z,ZK	3	2P+1C+10B	Z	Z
620UITS	Introduction to Intelligent Transport Systems Vladimír Faltus Pavel Hrubeš (Gar.)	Z,ZK	7	3P+2C+20B	Z	Z
612PPOK	Designing Roads, Highways and Motorways Tomáš Pad lek, Petr Kumpošt	KZ	3	1P+2C+10B	Z	Z
614DATS	Database Systems Ond ej Smíšek Jana Kaliková (Gar.)	KZ	2	1P+1C+10B	Z	Z
615JZ1A	Foreign Language - English 1 V ra Pastorková	Z	3	0P+4C+10B	Z	Z

Characteristics of the courses of this group of Study Plan: Code=3S PRE 22-23 P Name=3. sem. bak. PRE 22-23 povinné p edm ty (S_S) - B3710

<u>(0 0) - D3710</u>							
611FYZ	Physics	Z,ZK	5				
Kinematics, particle dyn	amics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.						
612MDE	Transport Models and Transport Excesses	Z,ZK	3				
Parameters of the traffic	p flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of	f queues, shock w	aves. Quality of				
transport and its assess	ment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consec	quences. Improvin	g of transport				
safety and fluency.	safety and fluency.						
617TGA	Graph Theory and its Applications in Transport	Z,ZK	4				
Basic terms of graph the	eory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in ot	her scientific disci	plines.				
618PZP	Elasticity and Strength	Z,ZK	3				
Tension and compression	n. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, be	olted and welded j	oint of structure.				
Analysis of deflection cu	urve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic fo	undation. Strengt	n analysis.				
620UITS	Introduction to Intelligent Transport Systems	Z,ZK	7				
Terminology and legislat	tive framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of ir	nformation and tel	ecommunication				
systems for ITS. Princip	les and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real example	oles of possible ap	plications of the				
principles of ITS.							
612PPOK	Designing Roads, Highways and Motorways	KZ	3				
Definition, types, owner	ship, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standa	ard speed. Route i	n rural areas.				
Range of vision for stop	ping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. S	afety device. Cros	sings, junctions,				
intersections.							
614DATS	Database Systems	KZ	2				
Basic concepts of datab	ase systems, conceptual model, relational data model, the principles of normal forms, relational database design, security a	nd integrity of dat	a, database				
queries, relational algeb	ora, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.						

615JZ1A	Foreign Language - English 1	Z	3	
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elemen				
stylistics forms. Oral and	d written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			

Code of the group: 4S P DOS 22-23

Name of the group: 4. sem. bak. PRE DOS 22-23 povinné p edm ty (obor DOS programu B3710) 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
611MSP	Modeling of Systems and Processes Jana Kuklová, Bohumil Ková Bohumil Ková (Gar.)	Z,ZK	4	2P+2C+12B	L	Z
612SDK	Highways, Motorways and Intersections Josef Kocourek, Tomáš Pad lek, Petr Kumpošt Josef Kocourek (Gar.)	Z,ZK	4	2P+2C	L	Z
618KAD	Kinematics and Dynamics	Z,ZK	4	2P+1C	L	Z
616DPY	Vehicle Technology	KZ	5	2P+2C	L	Z
615JZ2A	Foreign Language - English 2 V ra Pastorková, Jan Feit	Z,ZK	3	0P+4C+10B	L	Z

Characteristics of the courses of this group of Study Plan: Code=4S P DOS 22-23 Name=4. sem. bak. PRE DOS 22-23 povinné p edm ty (obor DOS programu B3710)

611MSP	Modeling of Systems and Processes	Z,ZK	4				
System and subsystem	external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of dif	ferential and differ	ential equations.				
Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems.							
Discretization of continu	Discretization of continuous systems. System interconnection.						
612SDK	Highways, Motorways and Intersections	Z,ZK	4				
Roads and motorways r	network, transport output. Types of direction curves. Hairpin bend. Stopping sight distance and overtaking sight distance. Levels	of traffic service.	Design elements				
of crossroads and inter	sections. Crossroads. Roundabouts. Intersections. Special types of junctions. Capacity of crossroads and intersections. Struc	ture of pavement	of roads and				
motorways. Road engir	eering structures. Assessment of route alternatives.						
618KAD	618KAD Kinematics and Dynamics Z,ZK 4						
Motion along a line, mo	tion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point m	ass dynamics and	system of point				
masses, equation of me	ption. Method of Newton. Princle of D'Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impa	act theory. Introdu	ction to the				
solution of vibration with	n multiple degrees of freedom.						
616DPY	Vehicle Technology	KZ	5				
Technical nomenclature	n transportation technology. Vehicle in legislation. Design. Operation. Influence on environment. Vehicle and ecology. Tractio	n engine characte	eristics -				
combustion engines, el	ectric engines, change of energy principles. Powertrain construction. Power transmission.						
615JZ2A	Foreign Language - English 2	Z,ZK	3				
Grammatical structures	Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary						
stylistics forms. Oral an	d written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.						

Code of the group: 4S P DOS 22-23 PV 1

Name of the group: 4. sem. bak. PRE DOS 22-23 povinné p edm ty-1.výb r (obor DOS programu B3710) 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
611EMOP	Electromagnetic Field and Optics Kurt Fišer Kurt Fišer Kurt Fišer (Gar.)	Z,ZK	4	2P+2C	L	Z
612DOPS	Traffic Surveys and Simulations	Z,ZK	4	2P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=4S P DOS 22-23 PV 1 Name=4. sem. bak. PRE DOS 22-23 povinné p edm ty-1.výb r (obor DOS programu B3710)

611EMOP	Electromagnetic Field and Optics	Z,ZK	4		
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.					
612DOPS	Traffic Surveys and Simulations	Z,ZK	4		
Theory of traffic flow. Methods of monitoring - profile, spatially time. Automatic traffic counts. Security parameters - accidents, near-misses. Surveys in public transport. Overview of					
traffic microsimulation models. Getting to know the working environment applications. Explanation of movement of vehicles in the traffic system. Creating and simulation of microscopic					
traffic model. Evaluation of the output characteristics. 4D visualization model.					

Code of the group: 4S P DOS 22-23 PV 2

Name of the group: 4. sem. bak. PRE DOS 22-23 povinné p edm ty-2.výb r (obor DOS programu B3710) 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
611MDS	Collection and Processing of Traffic Data	KZ	2	2P+0C	L	Z
618TK	Theory of Structures	KZ	2	2P+0C	L	Z

Characteristics of the courses of this group of Study Plan: Code=4S P DOS 22-23 PV 2 Name=4. sem. bak. PRE DOS 22-23 povinné p edm ty-2.výb r (obor DOS programu B3710)

611MDS	Collection and Processing of Traffic Data	KZ	2		
Basic principles of traffic detection and data collection, specific problems of the field of traffic data. Data preprocessing and analysis for use in additional applications.					
618TK	Theory of Structures	KZ	2		
Deformation in plane, principle of virtual work. Force (flexibility) method. Aplication of force method to frame analysis. Displacement (stiffness) method. Simplified and general stiffness					
method. Mathematical foundations of elasticity. Static analysis of complex statically indeterminate structure. Energy methods for beam analysis. Lagrange variational principle. Winkler					
model of electic foundation. Pactornak model of electic foundation					

Code of the group: 4S P DOS 22-23 PV 3

Name of the group: 4. sem. bak. PRE DOS 22-23 povinné p edm ty-3.výb r (obor DOS programu B3710) 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
614PPD	Computer Aid of Transportation Projecting	KZ	2	0P+2C	L	Z
618POM	Advanced Materials	KZ	2	0P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=4S P DOS 22-23 PV 3 Name=4. sem. bak. PRE DOS 22-23 povinné p edm ty-3.výb r (obor DOS programu B3710)

614PPD	Computer Aid of Transportation Projecting	KZ	2		
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks					
modification (attributes,	modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition curve, cross-and longitudinal				
section). Basics of 3D m	nodelling.				
618POM	Advanced Materials	KZ	2		
The knowledge gained in primary materials course is further developed. In greater physical detail it explains dynamics of strcture defects, phase diagrams of binary systems and other					
concepts. Special processes of structure control are discussed. The gained knowledge is utilized on description of contemporary technologies of material production for key industrial					
applications.					

Code of the group: 5S P DOS 22-23 P

Name of the group: 5. sem. bak. PRE DOS 22-23 povinné p edm ty (B3710) 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 5 courses 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
612MKOD	City Rail Transport Ond ej Trešl	Z,ZK	5	2P+1C	Z	Z
612ZELP	Railway Operation Tomáš Javo ik	Z,ZK	4	2P+2C	Z	Z
616DYJ	Vehicle Dynamics	Z,ZK	3	2P+1C	Z	Z
622PRES	Road Traffic Accidents Prevention	KZ	4	2P+1C	Z	Z
622UAN	Road Traffic Accidents Analysis Introduction	KZ	2	1P+2C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=5S P DOS 22-23 P Name=5. sem. bak. PRE DOS 22-23 povinné p edm ty (B3710)

612MKOD	City Rail Transport	Z,ZK	5		
City and suburban rail t	ansport. Tram lines layout and city roads. Tram track geometry parameters. Tram track superstructure. Turnouts and other co	nstruction of tram	lines. Tram		
stops and turn space. U	nderground and its basic characteristics. Underground nets in the world and undeground history in Prague. Underground track g	eometry paramete	ers. Underground		
track superstructure an	d substructure. Underground stations. Suburban rail transport.				
612ZELP	Railway Operation	Z,ZK	4		
Legislation in railway tra	nsport. Railway vehicles. Railway signals and signal devices. Railway traffic organisation and operation. Simplified railway tra	ffic operation. Ra	ilway vehicles		
brakes. Railway vehicle	s marking. Operation intervals. Theoretical graph of train running.				
616DYJ	Vehicle Dynamics	Z,ZK	3		
Application of mechanic	s. Wheel and axle suspension mechanism. Wheel to road positioning characteristics. Wheel - road contact. Skid and its chara	acteristics. Longitu	udinal dynamics,		
acceleration and decele	ration. Vertical dynamics, spring suspension, driving characteristics. Directional dynamics, gyroscopical characteristics. Driving	stability condition	ns. Aerodynamic		
forces. Driving and feed	back. ABS, ESP.				
622PRES	Road Traffic Accidents Prevention	KZ	4		
Basic relation causes -	prevention, collision diagrams, causes of not giving way, initial speed and breaking influence on speed of impact, downhill gra	de, load transpor	rt and fixation,		
collisions with pedestria	ins, cyclists and motorcyclists, construction of vehicle breaks, winter conditions, inconvenient road parameters, visibility, anti-	slide properties of	f road surface,		
solid barriers, assist sys	stems, technical fault of vehicles.				
622UAN	Road Traffic Accidents Analysis Introduction	KZ	2		
Important parameters of road infrastructure, typical vehicle dimensions, distance-time diagram, response time components, backward projection of accidental process, vehicle body					
post-crash deformation, impact influence on passengers, video documentation, problem who was the driver, documentation, marks analysis, limits of accidental analysis, cornering,					
critical maneuvring, tec	hnical view hindrances, visibility and discriminability, nightfall.				

Code of the group: 5S P DOS 22-23 PV

Name of the group: 5. sem. PRE DOS 22-23 povinné p edm ty - výb r (B3710) 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
612APE	Applied Ecology	Z	3	2P+0C	Z	Z
612VERD	Public Transport in Cities and Regions	Z	3	2P+0C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=5S P DOS 22-23 PV Name=5. sem. PRE DOS 22-23 povinné p edm ty - výb r (B3710)

612APE	Applied Ecology	Z	3		
Basic ecological principles. The atmosphere, air pollution from transport, smog, traffic share of greenhouse gas emissions. Transport within the different components of the environment.					
Nature and landscape protection, conflict of highway construction and protected areas NATURA 2000. The current ecological problems of the present. Rating losses from transport,					
especially in the context of traffic on the roads and delay construction of transport.					
612VERD	Public Transport in Cities and Regions	Z	3		
Public transport network design including determination of walking distances, characteristics of usable kind of transport, dimensioning transport capacity of lines, formation of lines,					
operational parametres of lines, objective way of quality evaluation of transport measures design.					

Code of the group: 6S P DOS 22-23 P

Name of the group: 6. sem. PRE bak. DOS 22-23 povinné p edm ty

Requirement credits in the group: In this group you have to gain 10 credits

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

Credits in the group: 10

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
612PPMK	Urban Road Traffic and Design	Z,ZK	4	2P+2C	L	Z
617GEDS	Geography of Transport Systems Milan K íž	KZ	2	2P+0C+8B	L	Z
622MEMT	Measurement Methods and Technology in Transportation	KZ	4	2P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=6S P DOS 22-23 P Name=6. sem. PRE bak. DOS 22-23 povinné p edm ty

<u>p</u>						
612PPMK	Urban Road Traffic and Design	Z,ZK	4			
Composition of urban road, elements and routes for traffic, pedestrian and cycling transport, projection of intersections, roundabouts, calming of traffic, parking, precaution for blind						
& partially-sighted, induction of traffic, organization and regulation of transport.						

617GEDS	Geography of Transport Systems	KZ	2		
Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction -					
theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographica					
analysis in transportation	n planning.				
622MEMT	Measurement Methods and Technology in Transportation	KZ	4		
Measurement methods in transport, their meaning and use; Geodetic basics in the Czech Republic; Angular, length and height measurements; Principles of mapping, accuracy and					
errors of geodetic measurements; Surveying and setting out; Challenges of localization, navigation and Global Navigation Satellite Systems; Laser scanning (terrestrial, mobile,					
UAV);Technical photography and photogrammetry;Dynamic measurements of vehicles;High-speed cameras;					

Code of the group: 6S P DOS 22-23 PV1 Name of the group: 6. sem. PRE bak. DOS 22-23 povinné p edm ty-výb r-1 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
612OMHD	Public Transport Operation	Z,ZK	4	2P+2C	L	Z
618DKS	Dynamics of Structures and Systems	Z,ZK	4	2P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=6S P DOS 22-23 PV1 Name=6. sem. PRE bak. DOS 22-23 povinné p edm ty-výb r-1

<u> </u>						
612OMHD	Public Transport Operation	Z,ZK	4			
Project of public transport organisation, project of city public transport network, transportation survey, project of transport parameters, transport graph, route and stops of line, public						
transport priority, financing of public transport, quality of public transport.						
618DKS	Dynamics of Structures and Systems	Z,ZK	4			
Vibration of systems with	h multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic cons	stants, other nume	erical methods.			
Systems with continuously distributed mass. Matrix form of equations of vibration. Finite element method in dynamics of structures. Solving vibrations by superposition of natural modes.						
Subspace iteration met	nods. Introduction to nonlinear vibrations.					

Code of the group: 6S P DOS 22-23 PV2 Name of the group: 6. sem. PRE bak. DOS 22-23 povinné p edm ty-výb r-2 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
616PAV	Passive Safety Zuzana Radová Josef Mík (Gar.)	Z,ZK	4	2P+1C	L	Z
617FID	Financing and investment in transport Alexandra Dvo á ková Olga Mertlová (Gar.)	Z,ZK	4	2P+1C+12B	L	Z

Characteristics of the courses of this group of Study Plan: Code=6S P DOS 22-23 PV2 Name=6. sem. PRE bak. DOS 22-23 povinné p edm ty-výb r-2

616PAV	Passive Safety	Z,ZK	4			
Road accident evaluation. Testing and legislation. Crash tests. Carbody properties. Injury mechanics. Restrain systems. Airbags. Road user safety. Mathematic modelling. Post collision						
safety systems.						
617FID	Financing and investment in transport	Z,ZK	4			
Sources of financing of transport infrastructure, the role of public administration in the financing and realization of investment in transport, the investment project project cycle, subsidy						
programs and their rules, competition, effectiveness and efficiency of spending public funds, evaluation systems of public projects and programs.						

Code of the group: 6S P DOS 22-23 PV3 Name of the group: 6. sem. PRE bak. DOS 22-23 povinné p edm ty-výb r-3 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
612ZAR	Introduction to Architectural Design Petr ervenka, Jana Kumpoštová	Z	3	2P+0C+8B	L	Z
618NMM	Numerical Methods in Mechanics	Z	3	2P+0C	L	Z

Characteristics of the courses of this group of Study Plan: Code=6S P DOS 22-23 PV3 Name=6. sem. PRE bak. DOS 22-23 povinné p edm ty-výb r-3

612ZAR	Introduction to Architectural Design	Z	3					
Urbanism and architecti	Urbanism and architecture of traffic systems. Bus and trolley-bus transport. Tramway and town tracks. Design of vehicles. Subway. Railway transport. Railway stations. Local							
communications. International airports.								
618NMM	Numerical Methods in Mechanics	Z	3					
Basics of the most used	numerical methods in structural mechanics. Central difference method, finite element method, finite volume method, bound	ary element meth	od. Time and					
spatial discretization schemes. Finite element method: derivation of the basic equations. Stiffness matrix, mass matrix, damping matrix for element and structure. Methods for solving								
systems of algebraic equations. Numerical integration. Programming the FEM.								

Name of the block: Semestrální projekt Minimal number of credits of the block: 6 The role of the block: ZP

Code of the group: PROJ 22-23 Name of the group: projekty od 22-23 (4., 5., 6. sem.) - pro B3710 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
615X31	Project 1	Z	2	0P+1C	L	ZP
620X31	Project 1	Z	2	0P+1C	L	ZP
612X31	Project 1	Z	2	0P+1C	L	ZP
622X31	Project 1	Z	2	0P+1C	L	ZP
617X31	Project 1	Z	2	0P+1C	L	ZP
616X31	Project 1	Z	2	0P+1C	L	ZP
617X32	Project 2	Z	2	0P+2C	Z	ZP
622X32	Project 2	Z	2	0P+2C	Z	ZP
612X32	Project 2	Z	2	0P+2C	Z	ZP
620X32	Project 2	Z	2	0P+2C	Z	ZP
615X32	Project 2	Z	2	0P+2C	Z	ZP
616X32	Project 2	Z	2	0P+2C	Z	ZP
616X33	Project 3	Z	2	0P+1C	L	ZP
620X33	Project 3	Z	2	0P+1C	L	ZP
615X33	Project 3	Z	2	0P+1C	L	ZP
612X33	Project 3	Z	2	0P+1C	L	ZP
622X33	Project 3	Z	2	0P+1C	L	ZP
617X33	Project 3	Z	2	0P+1C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=PROJ 22-23 Name=projekty od 22-23 (4., 5., 6. sem.) - pro B3710

615X31	Project 1	Z	2
620X31	Project 1	Z	2
612X31	Project 1	Z	2
622X31	Project 1	Z	2
617X31	Project 1	Z	2
616X31	Project 1	Z	2
617X32	Project 2	Z	2
622X32	Project 2	Z	2
612X32	Project 2	Z	2

620X32	Project 2	Z	2
615X32	Project 2	Z	2
616X32	Project 2	Z	2
616X33	Project 3	Z	2
620X33	Project 3	Z	2
615X33	Project 3	Z	2
612X33	Project 3	Z	2
622X33	Project 3	Z	2
617X33	Project 3	Z	2

Name of the block: Compulsory elective courses Minimal number of credits of the block: 8 The role of the block: PV

Code of the group: PVP PRE DOS 22-23 Name of the group: 4x PVP pro bak. PRE obor DOS od 22-23 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
621Y1AM	Aeronautical Information Management (AIM)	KZ	2	2P+0C	Z	PV
620Y1AF	Alternative Forms of Transportation Project Financing	KZ	2	2P+0C	Z	PV
618Y1AM	Anatomy, Mobility and Safety of Man	KZ	2	2P+0C	Z	PV
614Y1AV	Animation and Visualization	KZ	2	2P+0C	L	PV
620Y1AE	Applied Electronics	KZ	2	2P+0C	Z	PV
614Y1BE	Barrierless Transport	KZ	2	2P+0C	L	PV
615Y1BO	Work Safety and Health Protection in Transportation	KZ	2	2P+0C	L	PV
611Y1BK	Error Detection Codes for Interlocking Systems	KZ	2	2P+0C	Z	PV
621Y1BS	Unmanned aircraft systems 1	KZ	2	2P+0C	L	PV
614Y1BM	Biometric Methods	KZ	2	2P+0C	Z	PV
615Y1DZ	History of Railway	KZ	2	2P+0C	L	PV
612Y1DS	Project Documentation in Practice	KZ	2	2P+0C	Z	PV
617Y1EV	Public Sector Economy	KZ	2	2P+0C	Z	PV
623Y1EH	Electronics and hardware in security of transportation	KZ	2	2P+0C	L	PV
620Y1EK	Qualification in Electrical Engineering	KZ	2	2P+0C	L	PV
616Y1EN	Energy Requirements of Vehicles	KZ	2	2P+0C	L	PV
620Y1EA	Environmental Aspects of Transport	KZ	2	2P+0C	Z	PV
615Y1EH	European Integration within Historical Context	KZ	2	2P+0C	Z	PV
618Y1EM	Experimental Methods in Mechanics	KZ	2	2P+0C	Z	PV
615Y1FD	French Area Studies and Transportation	KZ	2	2P+0C	L	PV
614Y1HW	Computer Hardware	KZ	2	2P+0C	L	PV
615Y1HD	History of City Mass Transport	KZ	2	2P+0C	Z	PV
612Y1HD	Traffic Noise	KZ	2	2P+0C	L	PV
615Y1HE	Work Hygiene and Ergonomics in Traffic Petr Musil	KZ	2	2P+0C	Z	PV
616Y1IS	Interactive simulators and simulations Libor Žídek, Ond ej Smíšek, Ond ej Piksa, Martin Scháno, Ji í Zeisek	KZ	2	2P+0C	L	PV
612Y1KN	Combined Transportation	KZ	2	2P+0C	Z	PV
612Y1KP	Communication and Promotion of Transport Projects	KZ	2	2P+0C	L	PV
620Y1KP	Communication and presentation skills	KZ	2	2P+0C	Z	PV
623Y1KM	Crisis Management	KZ	2	2P+0C	Z	PV
623Y1KO	Quantum Physics and Optoelectronics	KZ	2	2P+0C	L	PV

	T			1 1		
623Y1KB	Cyber security in transportation	KZ	2	2P+0C	L	PV
621Y1LJ	Aeronautical Radio and Flight Instruments	KZ	2	2P+0C	L	PV
621Y1LS	Air Traffic Services	KZ	2	2P+0C	L	PV
617Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2	2P+0C	L	PV
620Y1LN	Location and Navigation	KZ	2	2P+0C	L	PV
623Y1MK	Crisis Situation Management in Critical Infrastructure	KZ	2	2P+0C	L	PV
617Y1MD	Marketing in Transportation Alexandra Dvo á ková	KZ	2	2P+0C	Z	PV
618Y1MT	Engineering Materials	KZ	2	2P+0C	L	PV
621Y1MP	Matlab for project-oriented study	KZ	2	2P+0C	Z	PV
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2	2P+0C	Z	PV
615Y1MK	Modern History in Context: Every Day Life and Transport	KZ	2	2P+0C	L	PV
615Y1NE	German in the Economy and Society	KZ	2	2P+0C	Z	PV
621Y1OH	Airline Business and Operations	KZ	2	2P+0C	Z	PV
623Y1OK	Protection of Critical Objects and Infrastructures	KZ	2	2P+0C	L	PV
620Y1OI	Fare Collection and Information Systems	KZ	2	2P+0C	L	PV
614Y1OJ	Object - oriented programming in JAVA	KZ	2	2P+0C	L	PV
614Y1OP	Operating System	KZ	2	2P+0C	Z	PV
617Y10F	Personal Finance	КZ	2	2P+0C	Z	PV
620Y1OK	Alexandra Dvo á ková	KZ	2	2P+0C		PV
611Y1PV	Road Lighting	KZ	2	2P+0C	Z	PV PV
	Parametrical and Multicriterial Programming			+ +		
617Y1PM	Personnel Management Stanislava Holíková	KZ	2	2P+0C	L	PV
612Y1PC	Pedestrian and Cycling Transport	KZ	2	2P+0C	L	PV
614Y1PG	Computer Graphics	KZ	2	2P+0C	L	PV
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2	2P+0C	Z	PV
618Y1PS	Computer Simulations in Mechanics	KZ	2	2P+0C	L	PV
614Y1PI	Corporate Information System	KZ	2	2P+0C	Z	PV
614Y1PZ	Advanced Data Processing in Spreadsheets	KZ	2	2P+0C	Z	PV
621Y1PC	ATC Procedures and Activities	KZ	2	2P+0C	Z	PV
612Y1PD	Assessment of Transport	KZ	2	2P+0C	Z	PV
620Y1PK	Product Quality Management Processes	KZ	2	2P+0C	Z	PV
614Y1PJ	C Programming Language	KZ	2	2P+0C	Z	PV
612Y1C1	Designing Roads in Civil 3D I	KZ	2	2P+0C	L	PV
612Y1C2	Designing Roads in Civil 3D II	KZ	2	2P+0C	Z	PV
614Y1PA	3D Modeling in AutoCAD	KZ	2	2P+0C	Z	PV
616Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2	2P+0C	L	PV
621Y1PL	Operational Aspects of Aerodromes	KZ	2	2P+0C	L	PV
621Y1PA	Air Traffic Control Operating Procedures	KZ	2	2P+0C	Z	PV
612Y1PU	Organization Disposition of Railway Stations	KZ	2	2P+0C	L	PV
612Y1RU	Railway Lines Reconstruction	KZ	2	2P+0C	Z	PV
616Y1RE	Control and Electronic Vehicle Systems	KZ	2	2P+0C	Z	PV
621Y1RZ	Human Resources Management	KZ	2	2P+0C	L	PV
617Y1ST	Titan Simulation	KZ	2	2P+0C	L	PV
621Y1SI	ATC Simulator	KZ	2	2P+0C	L	PV
620Y1SC	Sensors and Actuators	KZ	2	2P+0C	L	PV
617Y1SL	Sociology of Human Resources Stanislava Holíková	KZ	2	2P+0C	Z	PV
611Y1SI	Transportation Software Engineering	KZ	2	2P+0C	Z	PV
616Y1KS	Quality and Reliability of Vehicles	KZ	2	2P+0C	Z	PV
612Y1SU	Management and Maintenance of Roads	KZ	2	2P+0C	L	PV
617Y1SK	Urban and Regional Rail Transport Systems	KZ	2	2P+0C	L	PV
621Y1TH	Aircraft Technical Handling	KZ	2	2P+0C	Z	PV

611Y1TG	Crank Theory	KZ	2	2P+0C	L	PV		
614Y1TI	Graph Theory Creating Interactive Internet Applications	KZ	2	2P+0C	L	PV		
621Y1UL	Creating Interactive Internet Applications Aircraft Maintenance	KZ	2	2P+0C	L	PV		
614Y1UP		KZ	2	2P+0C	L	PV		
618Y1UK	Editing of Theses in MS Word	KZ	2	2P+0C	L			
623Y1VS	Introduction of Rail Vehicles	KZ KZ			Z	PV		
614Y1VM	Negotiation and Cooperation	KZ KZ	2	2P+0C 2P+0C	Z	PV		
	Development of Applications for Mobile Devices					PV		
616Y1VT	Development in Railroad Vehicles	KZ	2	2P+0C	L	PV		
614Y1WG	Webdesign	KZ	2	2P+0C	Z	PV		
614Y1W1	Webdesign 1	KZ	2	2P+0C	Z	PV		
614Y1W2	Webdesign 2	KZ	2	2P+0C	L	PV		
616Y1ZG	Introduction into Applied Computer Graphics	KZ	2	2P+0C	L	PV		
614Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2	2P+0C	L	PV		
611Y1ZM	Foundation of MATLAB Programming Šárka Vorá ová	KZ	2	2P+0C	L	PV		
614Y1ZJ	Fundamentals of programming in JAVA	KZ	2	2P+0C	Z	PV		
612Y1ZU	Principles of Urbanism	KZ	2	2P+0C	Z	PV		
615Y1ZV	East-West dichotomy: Prelude to the Cold War	KZ	2	2P+0C	Z	PV		
616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2	2P+0C	Z	PV		
	courses of this group of Study Plan: Code=PVP PRE DOS 22-2	23 Name=4x	PVP pro					
	onautical Information Management (AIM) of AIS and AIM. Transition from AIS to AIM. Regulatory base. Provision of AIS/AIM in	the Czech Rep	AIP (Aerona		KZ	2 R Manual of		
	m. NOTAM messages.PIB (Pre-flight Informtion Bulletin). AIC (Aeoronautical Inf. Circu							
	(Aeronautical Data Quality). AIXM (Aeronautical Inf. Exchnage Format).							
	ernative Forms of Transportation Project Financing				KZ	2		
	of financing in transportation and telecomunications, where the public sector body po participant of the transaction and it is not the counterparty of the financial institute wh							
of transportation and telecom			undungi lood	o or occurrat				
	atomy, Mobility and Safety of Man				KZ	2		
-	structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical s ar-skeletal system. Injury of human organs and musculo-skeletal system during traffic							
	eans and traffic safety regulations.	accidents. Mobili	ly of ill ariu i	njureu marr				
	mation and Visualization				KZ	2		
	nodeling of NURBS, Patch objects, selection of objects (according to filter and propert Iters, Motion blur, advanced animations, Motion panel. Modeling for morphing and an	,		•		•		
	iters, motion biur, advanced animations, motion panel. Modeling for morphing and an	Imation, bone for	nation, anin		KZ	natics.		
	or components, their principles, characteristics and typical connection diagrams. Sem	niconductor PN jui	nction diode					
	Functions of basic electronic circuits and methods for their designs (rectifiers, voltage	regulator with Ze	ner diode, t	ransistor as	an amplifier, c	operational		
amplifier as an inverting and					1/7			
	rierless Transport ssible public transportation in terms of architectural barriers and also for transportation	-technological poi	nt of view. S	1	KZ pain theoretic	2 al knowledge		
	ds, railway stations, public transport stops, terminal buildings, vehicles, public transpor	• •			-	Ũ		
	supplemented by practical examples.							
	rk Safety and Health Protection in Transportation nition of terms, risks and possible health damage, working conditions and health prote	action with focus o	n transport	1	KZ	2 rogrammes		
-	I foreign business trips, statistics, working practice.				protootion pr	-yrannico,		
611Y1BK Erro	or Detection Codes for Interlocking Systems				KZ	2		
	hods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Sc			hannels, de	tection of tran	smission		
	ed error. Design and assessment of detection codes; requirements of the European s nanned aircraft systems 1	alandard EN 5015	9.		KZ	2		
	nent. Aircraft design. Legislation in force in the Czech Republic. Planning and execution	on of the flight. Air	rspace divis	1	1			
procedures. Practical flights.								
614Y1BM Biometric Methods KZ 2								
Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics								
in transport applications, safety and risks of biometric technologies.								
615Y1DZ History of Railway KZ 2								
-	railways, railway network development in the 2nd half of 19th century, regional railway pment in the 2nd half of 20th century, high-speed railway origins, railway lines closing.			-				
War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.								
612Y1DS Pro	ject Documentation in Practice				KZ	2		
	ng. Project documentation types. Support materials for project documentation creating	g. Building permit	obtaining p	rocess. Budg	et and pricing	J. Practical		
creation of some project docu	creation of some project documentation parts.							

		1
617Y1EV Public Sector Economy	KZ	2
Economic and financial theory of public sector, public choice theory, externalites, decisions about public finance allocation, economic assessment		
tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, fund		-
623Y1EH Electronics and hardware in security of transportation	KZ	2
Types and parameters of signals. Passive circuits, properties, basic measurements. Passive filters, semiconductors. Operational amplifiers, basic		
Power supplies. Logic circuits. AD converters. Connection of analog and digital parts. Basic blocks of digital signal processing. Measurement proces in electronics.	sing. Design and fabi	rication methods
620Y1EK Qualification in Electrical Engineering	KZ	2
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock ha	1	_
voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, lec	-	-
in relation to health and safety and electrical engineering.	,,	
616Y1EN Energy Requirements of Vehicles	KZ	2
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic e	nergy. Combustion e	ngine, electric
drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.		
620Y1EA Environmental Aspects of Transport	KZ	2
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, proba	bilistic forecasts, fore	ecast evaluation.
Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transport	sportation in climate	change.
615Y1EH European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communi		
goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war a	and its consequence	s for Europe.
New quality of French-German relationship - a driving power of starting European integration.		-
618Y1EM Experimental Methods in Mechanics	KZ	2
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destru	-	-
experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measuremen Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.	t. Fatigue and lifetime	e prediction.
	KZ	2
615Y1FD French Area Studies and Transportation France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air	· · · · · · · · · · · · · · · · · · ·	_
French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastro	-	erminology.
614Y1HW Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separ	1 1	
arithmetic and logical units, I/O subsystem.	gggggg	,
615Y1HD History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current ti	1 1	
clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and		
612Y1HD Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regu	lations. Creation acc	oustic climate in
area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the ar		
computing and measurement of transport noise. Acoustic studies, measuring protocol.		odology of
computing and measurement of transport noise. Acoustic studies, measuring protocol. 615Y1HE Work Hygiene and Ergonomics in Traffic	rea of interest. Metho	odology of
computing and measurement of transport noise. Acoustic studies, measuring protocol. 615Y1HE Work Hygiene and Ergonomics in Traffic Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of the influe	ea of interest. Metho KZ ese factors on health	odology of 2 n of workers.
computing and measurement of transport noise. Acoustic studies, measuring protocol. 615Y1HE Work Hygiene and Ergonomics in Traffic Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of th Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology	ea of interest. Metho KZ ese factors on health	odology of 2 n of workers.
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620Y1LN	Location and Navigation	KZ	2
	les of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and explanation and e	amples of datase	ets for finding
	routing algorithms, their properties and implementation.		
623Y1MK	Crisis Situation Management in Critical Infrastructure	KZ	2
	I infrastructute elements on all levels, their protection systems, responsibilities of particular agencies of the state administration	-	overnment, and
	anounce particular safety provisions. Physical and cyber protection of critical infrastructure with special attention to the soft ta	-	
617Y1MD	Marketing in Transportation	KZ	2
	arketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transpo	rt and the resultin	g differences in
the application of marke		V7	2
618Y1MT	Engineering Materials main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers.	KZ	_
,	and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection	· · ·	
621Y1MP	Matlab for project-oriented study	KZ	2
	s focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exerci-	1 1	
	sed on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvem		-
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
	ng - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipe		
	ndering - physical and material properties, lighting sources. MKP - visual example.		
615Y1MK	Modern History in Context: Every Day Life and Transport	KZ	2
	nodern history of every day life, science, technology and transport in a wider context.		_
615Y1NE	German in the Economy and Society	KZ	2
	social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic	1	
selected topics.			
621Y10H	Airline Business and Operations	KZ	2
	omprehensive view of the commercial, operational and transportation activities of air transport companies. It focuses on the orga	1 1	
-	strategy, economic and operational indicators. It introduces students in detail to operational processes and the essentials of tra		-
	nomic aspects of air transport.		
623Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
	systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, s	1	_
infrastructures.			,
620Y1OI	Fare Collection and Information Systems	KZ	2
	in public transport and their components (on-board units, validators, turnstiles,). Information systems and their componen	1	
-	s (cycles, location or current delay of vehicles,). The issue of tariff systems. Other examples of clearance systems (parking	-	
614Y1OJ	Object - oriented programming in JAVA	KZ	2
	apsulation, Classes, Attributes, Access Modifiers, Methods and Overloading, Special Methods (Constructors, Getters / Sette	1 1	
	Inheritance, Polymorphism, Statics, constants, interfaces, abstract classes, enum, packages, exceptions, collections, generics		
functions			
614Y1OP	Operating System	KZ	2
Distributions. Installatio	n GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Progran	ns and processes	s. OS boot,
runlevels. Basic console	e programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, grap	phic editors, soun	d, video and
communication. Service	es management. Safe and secure configuration of OS. Remote administration.		
617Y1OF	Personal Finance	KZ	2
Personal finance (budg	et, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of he	ousing (rent, mort	gage, savings,
consumer loans, refinar	ncing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability a	and adequacy), se	curing the future
(retirement savings and	insurance).		
620Y1OK	Road Lighting	KZ	2
	and terms, street lighting components (luminaires, control cabinets for street lighting, street lighting cables), characteristics of l	-	-
	ards, measurement of illuminance and luminance in road lighting, tunnels, conceptual approach to street lighting design, ligh	ting calculations in	n DIALux and
Relux, street lighting co			
611Y1PV	Parametrical and Multicriterial Programming	KZ	2
	of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear constraints		
617Y1PM	Personnel Management	KZ	2
	proup, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercul	tural communicat	
612Y1PC	Pedestrian and Cycling Transport	KZ	2
-	Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle routes and the second sec	-	
	of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossin	ngs with other trar	nsport modes,
	s and road marking for cyclists.		
614Y1PG	Computer Graphics	KZ	2
	c and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with ec	liting programs (w	ithin the user
	s, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.		
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
	ation for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting,		
	relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic trans	sition curve, cross-	-and longitudinal
section). Basics of 3D r		1/7	2
618Y1PS	Computer Simulations in Mechanics / of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model dev		2 antation of
	AE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary	-	-
	ac systems. Assignment of material properties. The types of elements and their use. Discretization of solid model, boundary included and model analysis. Introduction to complex nonlinear problems.	oonanaana ana ap	
614Y1PI	Corporate Information System	KZ	2
	edge, components of information system, syntatic and semantic sense of data, structure of corporate information system, pa		
	on, storage, etc.), corporate information system, syntatic and semantic sense of data, structure of corporate information system, pa		-
	n, information system security, data protection, safety politics.		,

614Y1PZ Advanced Data Processing in Spreadsheets	KZ	2				
Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of fo						
		-				
addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.						
621Y1PC ATC Procedures and Activities	KZ	2				
Air traffic control procedures, basics of communication and phraseology, aircraft identification, spacing and traffic coordination. In addition, the cou						
the airports and low visibility operational procedures. Students will during the course learn basic safety management applications applied across t						
		2				
612Y1PD Assessment of Transport	KZ	2				
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibil						
transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples the environment.	or assessment or tra	amic buildings on				
	1/7	0				
620Y1PK Product Quality Management Processes	KZ	2				
General principles of organization management. Management systems and international standards; quality management systems. Quality product						
of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management	ient. Uniform framev	ork of standards				
for systems management. Process management principles. Metrology and testing. Product certification.						
614Y1PJ C Programming Language	KZ	2				
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocatio	n, string, files, struct	ures and unions.				
Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise oprerators.						
612Y1C1 Designing Roads in Civil 3D I	KZ	2				
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go thr		-				
particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation.	The course also inc	ludes a basic				
explanation of the traffic building design in the real-life profession.						
612Y1C2 Designing Roads in Civil 3D II	KZ	2				
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go thr	ough the complete of	design of this				
particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation.	The previously acqu	uired skills are				
improved and developed. Students learn to design intersections.						
614Y1PA 3D Modeling in AutoCAD	KZ	2				
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, of	ject data creation, v	vork with data				
connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.						
616Y1PV Operation, Construction and Maintenance of Vehicles	KZ	2				
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission meas		on mechanism.				
General principles of engine diagnostics.						
621Y1PL Operational Aspects of Aerodromes	KZ	2				
Operational aspects of aerodromes. Location of aerodrome and orientation of runways. Requirements for apron. Capacity of airports runways and						
conditions. Firefighting units. Protection against unlawful interference. Local transport connection. Environmental protection.	torrininalo. Operatio					
	K7	2				
621Y1PA Air Traffic Control Operating Procedures	KZ	2				
621Y1PA Air Traffic Control Operating Procedures Practical exercises on the ATC simulator with the following focus - getting familiar with the simulation environment, acquiring basic habits, aircraft	dentification proced	ures, vectoring,				
621Y1PA Air Traffic Control Operating Procedures Practical exercises on the ATC simulator with the following focus - getting familiar with the simulation environment, acquiring basic habits, aircraft level changes, ATC clearance, use of RNAV points. Practical exercises focused on the basis of vectoring, timely application of vertical spacing, ES	dentification proced	ures, vectoring,				
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621Y1PA Air Traffic Control Operating Procedures Practical exercises on the ATC simulator with the following focus - getting familiar with the simulation environment, acquiring basic habits, aircraft level changes, ATC clearance, use of RNAV points. Practical exercises focused on the basis of vectoring, timely application of vertical spacing, ES Exercises in the APPROACH airspace, arrivals, departures and conflict solutions. 612Y1PU Organization Disposition of Railway Stations Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Reserve stations. Technology of work in arilway station with regard to its disposition. Railway station documentations in the Czech Republic railwag 612Y1RU Railway Lines Reconstruction Keeping railway line operational, maintaining lines and stations, geometrical alignment of railway line reconstruction. 616Y1RE Control and Electronic Vehicle Systems Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, d and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic contromoting tystems. 621Y1RZ Human Resources Management Tha position of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation a dismissal and redundancies of employees. Education of employees. Planning career management. 61Y1RZ Titan Simulation	dentification proced T and REV messag KZ Zone stations. Form y network. KZ tructure maintenand KZ sadvantages, functi- iol, safety, communi- KZ agement. Internal ar nd remuneration of s KZ use of RNAV points ACH area, practicing KZ sors of mechanical, e KZ t, human resources KZ	ures, vectoring, le transmission. 2 hation yards. 2 ce, scheduling 2 on. Conventional cation and 2 d external staff. Positioning, 2 a price and ions by the form 2 s. Practical g arrival and 2 electro-magnetic, 2 planning, culture 2				

616Y1KS Quality and Reliability of Vehicles	KZ	2		
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability.	1 1			
Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturying, Quality, Services) and other method	s used in industria	l applications.		
Knowledge-based systems of quality and reliability, data collection.				
612Y1SU Management and Maintenance of Roads	KZ	2		
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented develo	pment of road net	work, short,		
medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and re	pair methods are	discussed in the		
classroom as well as investment activity in highway engineering.				
617Y1SK Urban and Regional Rail Transport Systems	KZ	2		
Factors affecting transport demand, modal-split, distribution of passenger flows on public regional transport lines. Optimization of line management,	line networking. C	reating and		
evaluation of the timetable. Vehicle circulation creation. Optimizing driver shifts and arranging them in turnus. Effects of barrier-free and public transport of the timetable.	port preferences. T	he role of		
marketing.				
621Y1TH Aircraft Technical Handling	KZ	2		
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-acing and anti-icing units. Loading and unle		ment for		
passangers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress	s.			
611Y1TG Graph Theory	KZ	2		
Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees				
path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existen	ce and optimization	n and algorithms		
for their solving. Computational complexity, dealing with NP-complete problems, heuris				
614Y1TI Creating Interactive Internet Applications	KZ	2		
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions.	Your own applicat	ion programmed		
in PHP language.				
621Y1UL Aircraft Maintenance	KZ	2		
Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and	qualification of avi	ation personnel.		
Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft ma	intenance. Regula	tion of director		
EASA for aircraft maintenance. Seminars will be focused on practical application.				
614Y1UP Editing of Theses in MS Word	KZ	2		
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, cre	ate tables of conte	ents, lists of		
figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamles	s editing dissertati	ons and theses,		
so that they are able to concentrate mainly on writing a thesis.				
618Y1UK Introduction of Rail Vehicles	KZ	2		
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion	train and unit trair	ns. Rolling and		
track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehic		- 1		
and electric drive. Design concept rail vehicles and drive of wheel set.				
623Y1VS Negotiation and Cooperation	KZ	2		
Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Inf	ormal and formal r	ole in the team.		
Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", spi				
trust.				
614Y1VM Development of Applications for Mobile Devices	KZ	2		
Object oriented programming, Java programming language, development environment, operating system Android, development application - widge	s, containers, thre	ads, menu,		
permissions, services, GUI.				
616Y1VT Development in Railroad Vehicles	KZ	2		
Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal tr	1			
assesment. New materials in design. International standardization.				
614Y1WG Webdesign	KZ	2		
Students will learn the basics of HTTP communication, URL and addressing, HTML5 markup language, advanced CSS3 techniques, accessible an	1 1			
webdesign, content management systems, web server installation + configuration directives. The subject matter will be trained on examples.				
614Y1W1 Webdesign 1	KZ	2		
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web access	1 1			
and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced	, ,			
		2		
614Y1W2 Webdesign 2 Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web	KZ			
directives. Topics will be practiced on practical examples.		r + configuration		
	1/7			
616Y1ZG Introduction into Applied Computer Graphics	KZ	2		
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour s				
and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basi	cs. Introduction to	2D and 3D		
graphics software.	1/7			
614Y1ZM Fundamentals of parametric and adaptive modeling	KZ	2		
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models fro	om 2D sketches. In	nport and export		
from and to another systems. Fundamentals of assemblies creation.				
	KZ	2		
611Y1ZM Foundation of MATLAB Programming	matrices and elem	ents operations,		
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators,	·			
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging.	KZ	2		
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging. 614Y1ZJ Fundamentals of programming in JAVA		Conversion Taxt		
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging. 614Y1ZJ Fundamentals of programming in JAVA Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing,				
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging. 614Y1ZJ Fundamentals of programming in JAVA Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods for				
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging. 614Y1ZJ Fundamentals of programming in JAVA Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods f parameters, return value, recursion, Program creation	or field work, ASC	II, Functions,		
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging. 614Y1ZJ Fundamentals of programming in JAVA Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods f parameters, return value, recursion, Program creation 612Y1ZU Principles of Urbanism	or field work, ASC	II, Functions,		
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, control flow, inputs and outputs, graphics, optimization and program code debugging. 614Y1ZJ Fundamentals of programming in JAVA Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods f parameters, return value, recursion, Program creation	or field work, ASC	II, Functions,		

615Y1ZV	East-West dichotomy: Prelude to the Cold War	KZ	2		
Historical prologue, evo	ution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and con	tinuity of the interr	national relations		
in the end of 19th centu	ry and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress,	the causes and co	onsequences.		
Economic and financial	history. Social changes. Discussions on texts, sources.				
616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2		
Vehicle costruction, aggregate computing, driving resistance, building and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation					
in the EU and in the wo	rld, creation of technical legislation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.				

Name of the block: Jazyky Minimal number of credits of the block: 6 The role of the block: J

Code of the group: JZ 2 PRE (5.-6.SEM) Name of the group: Jazyky bak. PRE pro 5. a 6. sem. (2.cizí jazyk) - pro B3710 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 2 courses Credits in the group: 6 Note on the group:

Note on the g	loup.					
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
615JZ3F	Foreign Language - French 3	Z	3	0P+4C+10B	Z	J
615JZ3I	Foreign Language - Italian 3	Z	3	0P+4C+10B	Z	J
615JZ3N	Foreign Language - German 3 René Skalický	Z	3	0P+4C+10B	Z	J
615JZ3R	Foreign Language - Russian 3 Vilma Gottwaldová	Z	3	0P+4C+10E	Z	J
615JZ3S	Foreign Language - Spanish 3	Z	3	0P+4C+10B	Z	J
615JZ4F	Foreign Language - French 4	Z,ZK	3	0P+4C+10B	L	J
615JZ4I	Foreign Language - Italian 4	Z,ZK	3	0P+4C+10B	L	J
615JZ4N	Foreign Language - German 4 René Skalický, Sv tlana Petrová, Eva Rezlerová	Z,ZK	3	0P+4C+10B	L	J
615JZ4R	Foreign Language - Russian 4 Vilma Gottwaldová	Z,ZK	3	0P+4C+10B	L	J
615JZ4S	Foreign Language - Spanish 4	Z,ZK	3	0P+4C+10B	6 L	J

Characteristics of the courses of this group of Study Plan: Code=JZ 2 PRE (5.-6.SEM) Name=Jazyky bak. PRE pro 5. a 6. sem. (2.cizí jazyk) - pro B3710

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. 615JZ31 Foreign Language - Italian 3 Z 3					
features. Practice of oral and written presentation. 615JZ3I Foreign Language - Italian 3 Z 3					
615JZ3I Foreign Language - Italian 3 Z 3					
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.					
615JZ3N Foreign Language - German 3 Z 3					
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.					
615JZ3R Foreign Language - Russian 3 Z 3					
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.					
615JZ3S Foreign Language - Spanish 3 Z 3					
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.					
615JZ4F Foreign Language - French 4 Z,ZK 3					
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.					
615JZ4I Foreign Language - Italian 4 Z,ZK 3					
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.					

615JZ4N	Foreign Language - German 4	Z,ZK	3
Grammar and stylistics.	Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of	of language struct	ure knowledge
and perceptive and con	municative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Wo	rk with (profession	nal) text and its
features. Practice of ora	I and written presentation.		
615JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics.	Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of	of language struct	ure knowledge
and perceptive and con	municative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Wo	rk with (profession	nal) text and its
features. Practice of ora	I and written presentation.		
615JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics.	Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of	of language struct	ure knowledge
and perceptive and con	municative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Wo	rk with (profession	nal) text and its
features. Practice of ora	I and written presentation.		

List of courses of this pass:

	Name of the course	Completion	Credits
611CAL1	Calculus 1	Z,ZK	7
Sequence of real r	humbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dim		n space and
Cartes	ian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of sev	eral real variables	
611CAL2	Calculus 2	Z,ZK	5
Antiderivative, N	lewtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Para	metric description	of regular
k-dimensional su	urfaces in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary diffe	erential equations	of the first
	order, linear differential equations with constant coefficients and its systems.		
611EMOP	Electromagnetic Field and Optics	Z,ZK	4
	Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.		
611FYZ	Physics	Z,ZK	5
	Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.		I
611GIE	Geometry	KZ	3
Orthographic and	d oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - param	eterization, arc of	the curve,
torsion	and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving	on a curved path	
611LA	Linear Algebra	Z,ZK	3
Vector spaces (line	ear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and thei	r solvability. Deter	ninants and
	their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification	on.	
611MDS	Collection and Processing of Traffic Data	KZ	2
Basic prin	ciples of traffic detection and data collection, specific problems of the field of traffic data. Data preprocessing and analysis for use in a	dditional application	ns.
611MSP	Modeling of Systems and Processes	Z,ZK	4
	stem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differe		al equations
	nlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer functio		
	Discretization of continuous systems. System interconnection.		
611STAT	Statistics	Z,ZK	4
	Statistics bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. T	•	
Definition of proba		esting of statistical	hypothesis
Definition of proba	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The second s	esting of statistical	hypothesis
Definition of proba	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. To prrelation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear reg	esting of statistical	hypothesis
Definition of proba Regression and co 611Y1BK	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. To prrelation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear re multiple regression, the use of matrices in regression.	esting of statistical gression, analysis KZ	hypothesis of variance 2
Definition of proba Regression and co 611Y1BK	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. To bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. To bility, random variable and its description, coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, the use of matrices in regression. Error Detection Codes for Interlocking Systems	esting of statistical gression, analysis KZ ls, detection of tra	hypothesis of variance 2
Definition of proba Regression and co 611Y1BK	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. To prrelation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, ultiple regression, the use of matrices in regression. Error Detection Codes for Interlocking Systems ation and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channe	esting of statistical gression, analysis KZ ls, detection of tra	hypothesis of variance 2
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prelation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression. Error Detection Codes for Interlocking Systems ation and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channe errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 5	esting of statistical gression, analysis KZ ls, detection of tra 0159. KZ	hypothesis of variance 2 nsmission 2
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prevail of the second secon	esting of statistical gression, analysis KZ ls, detection of tra 0159. KZ	hypothesis of variance 2 nsmission 2
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV Solution to the pro 611Y1SI	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prevail of the series of th	esting of statistical gression, analysis KZ Is, detection of tra 0159. KZ mputation of effici KZ	hypothesis of variance 2 nsmission 2 ent solution 2
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV Solution to the pro 611Y1SI	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prevail of the second secon	esting of statistical gression, analysis KZ Is, detection of tra 0159. KZ mputation of effici KZ	hypothesis of variance 2 nsmission 2 ent solution 2
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV Solution to the pro 611Y1SI	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prevail of the series of th	esting of statistical gression, analysis KZ Is, detection of tra 0159. KZ mputation of effici KZ	hypothesis of variance 2 nsmission 2 ent solution 2
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV Solution to the pro 611Y1SI Basic concepts of s 611Y1TG	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prevail linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, the use of matrices in regression. Error Detection Codes for Interlocking Systems ation and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channe errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 5 Parametrical and Multicriterial Programming blem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Co Transportation Software Engineering software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implement and practical usuage.	esting of statistical gression, analysis KZ Is, detection of tra 0159. KZ mputation of effici KZ tation using forma KZ	hypothesis of variance 2 nsmission 2 ent solution 2 I techniques
Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV Solution to the pro 611Y1SI Basic concepts of s 611Y1TG Basic concepts an	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The prevail linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, the use of matrices in regression. Error Detection Codes for Interlocking Systems ation and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channe errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 5 Parametrical and Multicriterial Programming blem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Co Transportation Software Engineering software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implement and practical usuage. Graph Theory	esting of statistical gression, analysis KZ Is, detection of tra 0159. KZ mputation of effici KZ tation using forma KZ imum spanning tr	hypothesis of variance 2 nsmission 2 ent solution 2 I techniques 2 ee, shortes
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Definition of probal Regression and co 611Y1BK Safe communica 611Y1PV Solution to the pro 611Y1SI Basic concepts of 611Y1TG Basic concepts ar path problem, Eule 611Y1ZM	bility, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. The general linear model, statistical inference in linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, linear regression, the use of matrices in regression. Error Detection Codes for Interlocking Systems ation and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channe errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 5 Parametrical and Multicriterial Programming been of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Co Transportation Software Engineering software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implement and practical usuage. Graph Theory d terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, min pran, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence ar for their solving. Computational complexity, dealing with NP-complete problems, heuris Foundation of MATLAB Programming	esting of statistical gression, analysis KZ Is, detection of tra 0159. KZ mputation of effici KZ tation using forma KZ imum spanning tr nd optimization an KZ	hypothesis of variance 2 nsmission 2 ent solution 2 l techniques d algorithms 2
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612MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the	traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of qu	ieues, shock waves	s. Quality of
transport and its a	assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the conseque	ences. Improving o	f transport
	safety and fluency.		
612MKOD	City Rail Transport	Z,ZK	5
	an rail transport. Tram lines layout and city roads. Tram track geometry parameters. Tram track superstructure. Turnouts and other con		
stops and turn space	ce. Underground and its basic characteristics. Underground nets in the world and undeground history in Prague. Underground track geometer	etry parameters. U	nderground
	track superstructure and substructure. Underground stations. Suburban rail transport.		
612OMHD	Public Transport Operation	Z,ZK	4
Project of public tr	ansport organisation, project of city public transport network, transportation survey, project of transport parametres, transport graph,	route and stops of	line, public
	transport priority, financing of public transport, quality of public transport.		
612PPMK	Urban Road Traffic and Design	Z,ZK	4
Composition of u	ban road, elements and routes for traffic, pedestrian and cycling transport, projection of intersections, roundabouts, calming of traffic,	, parking, precautic	n for blind
	& amp; partially-sighted, induction of traffic, organization and regulation of transport.		
612PPOK	Designing Roads, Highways and Motorways	KZ	3
Definition, types,	ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard	speed. Route in ru	ural areas.
Range of vision for	stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safet	y device. Crossing:	s, junctions,
	intersections.		
612SDK	Highways, Motorways and Intersections	Z,ZK	4
	ays network, transport output. Types of direction curves. Hairpin bend. Stopping sight distance and overtaking sight distance. Levels of ti		n elements
	d intersections. Crossroads. Roundabouts. Intersections. Special types of junctions. Capacity of crossroads and intersections. Structu	-	
	motorways. Road engineering structures. Assessment of route alternatives.	·	
612VERD	Public Transport in Cities and Regions	7	3
	etwork design including determination of walking distances, characteristics of usable kind of transport, dimensioning transport capaci	ity of lines, formatic	
	operational parametres of lines, objective way of quality evaluation of transport measures design.	.,	,
612X31	Project 1	Z	2
		Z	
612X32	Project 2		2
612X33	Project 3	Z	2
612Y1C1	Designing Roads in Civil 3D I	KZ	2
	voted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through		-
particular linear b	uilding, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The	course also include	es a basic
	explanation of the traffic building design in the real-life profession.		
612Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is de	voted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through	n the complete des	ign of this
particular linear b	uilding, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The	previously acquired	d skills are
	improved and developed. Students learn to design intersections.		
612Y1DS	Project Documentation in Practice	KZ	2
Project document	ation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process.	Budget and pricing	. Practical
	creation of some project documentation parts.		
612Y1HD	Traffic Noise	KZ	2
Acoustic introducti	on, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulation	s. Creation acousti	c climate in
area, principles	of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area	of interest. Method	ology of
	computing and measurement of transport noise. Acoustic studies, measuring protocol.		
612Y1KN	Combined Transportation	KZ	2
Combined transp	oort strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas	. Multimodal logistic	c centres.
612Y1KP	Communication and Promotion of Transport Projects	KZ	2
	Public Relations and the power of public opinion. Work and tasks of PR department and press spokesperson. Communication with th		
	rond. Communication strategy of transport projects. Systematic goodwill building. Crisis situations in communication and preparation f		
	influence of political marketing and political PR on transport projects. Lobbing.		
612Y1PC	Pedestrian and Cycling Transport	KZ	2
	ans. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route	1 1	
	ation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings		-
,	crossroads. Traffic signs and road marking for cyclists.		,
612Y1PD	Assessment of Transport	KZ	2
	sport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of		
	s on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of ass	-	
	the environment.		
612Y1PU	Organization Disposition of Railway Stations	KZ	2
	on. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zon	I I	
-	rve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic		on yardo.
612Y1RU	Railway Lines Reconstruction	KZ	2
	ne operational, maintaining lines and stations, geometrical alignment of railway line, vehicles for railway superstructure and substruct	1 1	
Reeping raiway ii	and organising possesions, preparation of railway lines reconstruction and maintenance, process of railway line reconstruction		scheduling
612V1011		KZ	
612Y1SU	Management and Maintenance of Roads	1 1	2 ark abort
-	vith ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented develops erm strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair		
mealann ann 1011g-t	classroom as well as investment activity in highway engineering.	methous are discu	13960 111 [[]6
6401/4711		L/7	<u>^</u>
612Y1ZU	Principles of Urbanism	KZ	2
Survey on history	of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spacial	arrangement of se	attiements.
	Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.		

612ZAR	Introduction to Architectural Design	Z	3
Urbanism and	architecture of traffic systems. Bus and trolley-bus transport. Tramway and town tracks. Design of vehicles. Subway. Railway transport	t. Railway stations.	. Local
	communications. International airports.		
612ZELP	Railway Operation	Z,ZK	4
Legislation in raily	way transport. Railway vehicles. Railway signals and signal devices. Railway traffic organisation and operation. Simplified railway traffi	c operation. Railwa	y vehicles
	brakes. Railway vehicles marking. Operation intervals. Theoretical graph of train running.		
612ZTS	Railway Lines and Stations	Z,ZK	. 4
Rail transport. Ra	ailway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. S		way lines.
	Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail to	-	
612ZYDI	Introduction to Transportation Engineering ion in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, p		2 rt Nogativa
	impacts of transportation to environment and safety.	ublic mass transpo	n. Negalive
614ASD	Algorithm and Data Structures	KZ	3
	niliarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze		-
solutions to the s	et task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart ar	nd use the basics o	of Boolean
	algebra with forming the conditions for the algorithms.		
614DATS	Database Systems	KZ	2
Basic concepts of	of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and		database
	queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via		
614KSP	Constructing with Computer Aid	KZ	2
-	rm determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common wor		
and CA systems.	Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possib	ilites, AutoCAD env	vironment
	profiles, drawings with raster foundaments).	KZ	2
614PPD	Computer Aid of Transportation Projecting pplication for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, dat		- 1
	utes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition		
(section). Basics of 3D modelling.		5
614PRG	Programming	KZ	2
	pment, methods of structured programming, high-level programming languages, basics of C programming languages (types, variable	s, conditions, cycle	es, arrays,
	functions), programming techniques, complexity.		
614Y1AV	Animation and Visualization	KZ	2
	tions and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Spa		
	s, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation	-	
614Y1BE	Barrierless Transport	KZ	2
	rless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students		
of barrieriess enviro	onment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems Theoretical knowledge will be supplemented by practical examples.	and transportation	technology.
614Y1BM	Biometric Methods	KZ	2
	rms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, ha		
	nethod, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral r		
	in transport applications, safety and risks of biometric technologies.		
614Y1HW	Computer Hardware	KZ	2
Computer archite	ecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate p	parts designing - co	ontrollers,
	arithmetic and logical units, I/O subsystem.		
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies proj	gramming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipel Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.	ines, and distribution	on lines.
614Y1OJ	Object - oriented programming in JAVA	KZ	2
	ng, Encapsulation, Classes, Attributes, Access Modifiers, Methods and Overloading, Special Methods (Constructors, Getters / Setters		
	pes, Inheritance, Polymorphism, Statics, constants, interfaces, abstract classes, enum, packages, exceptions, collections, generics, lan		
	functions		
614Y1OP	Operating System	KZ	2
	stallation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Program		
runlevels. Basic o	console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graph	ic editors, sound, v	video and
	communication. Services management. Safe and secure configuration of OS. Remote administration.	T	
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
	pplication for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, dat		
modification (attribu	utes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition section). Basics of 3D modelling.	i curve, cross-and	longitudinai
614Y1PA	3D Modeling in AutoCAD	KZ	2
	arametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object		
	connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.		
614Y1PG	Computer Graphics	KZ	2
	graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editi	I I	
	level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphic	s cards.	
614Y1PI	Corporate Information System	KZ	2
	n-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, pa		-
(personalistic, prod	luction, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of	information system	n operation,
	state information system, information system security, data protection, safety politics.		

614Y1PJ C Programming Language KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocation, string, files, struc	tures and unions.
Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise oprerators.	
614Y1PZ Advanced Data Processing in Spreadsheets KZ	2
Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and funct	
addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution findin data analysis. Examples and questions from various companies and training.	J, solver, macros,
614Y1TI Creating Interactive Internet Applications KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own applications	
in PHP language.	1 - 3
614Y1UP Editing of Theses in MS Word KZ	2
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of c	
figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing disserta	tions and theses,
so that they are able to concentrate mainly on writing a thesis.	
614Y1VM Development of Applications for Mobile Devices KZ Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, f	broads monu
permissions, services, GUI.	meaus, menu,
614Y1W1 Webdesign 1 KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usabilit	, CSS properties
and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical	l examples.
614Y1W2 Webdesign 2 KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation	n + configuration
directives. Topics will be practiced on practical examples.	
614Y1WG Kebdesign KZ	2
Students will learn the basics of HTTP communication, URL and addressing, HTML5 markup language, advanced CSS3 techniques, accessible and usable web ru webdesign, content management systems, web server installation + configuration directives. The subject matter will be trained on examples.	les, responsive
614Y1ZJ Fundamentals of programming in JAVA KZ	2
Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Chain	
Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods for field work, As	
parameters, return value, recursion, Program creation	
614Y1ZM Fundamentals of parametric and adaptive modeling KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. I	mport and export
from and to another systems. Fundamentals of assemblies creation.	
615DPLG Transportation Psychology Z Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psyc	
of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport opera	
615JZ1A Foreign Language - English 1 Z	3
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative	skills. Elementary
stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.	
615JZ2A Foreign Language - English 2 Z,ZK	
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative	skills. Elementary
stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.	
615JZ3F Foreign Language - French 3 Z Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru	cture knowledge
and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	-
features. Practice of oral and written presentation.	
615JZ3I Foreign Language - Italian 3 Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru	cture knowledge
and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	onal) text and its
features. Practice of oral and written presentation.	
615JZ3N Foreign Language - German 3 Z	
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	-
features. Practice of oral and written presentation.	
615JZ3R Foreign Language - Russian 3 Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru	cture knowledge
and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	onal) text and its
features. Practice of oral and written presentation.	
615JZ3S Foreign Language - Spanish 3 Z	
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	-
features. Practice of oral and written presentation.	
615JZ4F Foreign Language - French 4 Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru	-
and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	onal) text and its
features. Practice of oral and written presentation.	
615JZ4I Foreign Language - Italian 4 Z,ZK	
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language stru and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professi	-
features. Practice of oral and written presentation.	,

615JZ4N	Foreign Language - German 4	Z,ZK	3
	cs. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of la communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work w		•
	features. Practice of oral and written presentation.		
615JZ4R	Foreign Language - Russian 4	Z.ZK	3
	s. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of la	,	-
-	ommunicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work w		-
	features. Practice of oral and written presentation.		
615JZ4S	Foreign Language - Spanish 4	Z,ZK	3
	s. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of la		
and perceptive and co	ommunicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work w	vith (professiona) text and its
	features. Practice of oral and written presentation.		
615X31	Project 1	Z	2
615X32	Project 2	Z	2
615X33	Project 3	Z	2
615Y1BO	Work Safety and Health Protection in Transportation	KZ	2
-undamental legislativ	ve, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. He	ealth protection p	programmes
	health insurance of home and foreign business trips, statistics, working practice.	1/7	0
615Y1DZ	History of Railway	KZ	2
-	s, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Repu development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connection		
.a. ii raiiwayo, raiiway	railway accidents, railway junctions. Excursions and projections.		201101100100
615Y1EH	European Integration within Historical Context	KZ	2
	mation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Litt		
-	litler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its		-
	New quality of French-German relationship - a driving power of starting European integration.		
615Y1FD	French Area Studies and Transportation	KZ	2
	and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traff	-	erminology.
	society and culture. Current political system. System of education, studying in France. Selected authors of French literature. Frence		
	History of City Mass Transport	KZ	2
615Y1HD	and a first of the second development of the second terms in the second se	فمرج ومرجز والمريحات الرمر	
listory of city mass tra	ansport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends a		
listory of city mass tra clearance	e systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Repub	lic and Slovakia.	1
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listory of city mass tra clearance 615Y1HE Basic knowledge of c	e systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Repub Work Hygiene and Ergonomics in Traffic	lic and Slovakia. KZ actors on health	2 of workers.
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listory of city mass tra clearance 615Y1HE Basic knowledge of c Creation and protecti 615Y1MK 615Y1NE Recent economic and 615Y1ZV iistorical prologue, evo in the end of 19th cer 616DPY Technical nomencl 616DYJ pplication of mechani	Be systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republe Work Hygiene and Ergonomics in Traffic Occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to portactical examples from the field of transportation; relevant legislative. Modern History in Context: Every Day Life and Transport Historical overview of modern history of every day life, science, technology and transport in a wider context. German in the Economy and Society d social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic and selected topics. East-West dichotomy: Prelude to the Cold War olution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuit ntury and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the Economic and financial history. Social changes. Discussions on texts, sources. Vehicle Technology lature in transportation technology. Vehicle in legislation. Design. Operation. Influence on environment. Vehicle and ecology. Traction combustion engines, electric engines, change of energy principles. Powertrain construction. Power transmission. Vehicle Dynamics ics. Wheel and axle suspension mechanism. Wheel to road positioning characteristics. Wheel - road contact. Skid and its characterier leration. Vertical dynamics, spring suspension, driving characteristics. Directional dynamics, gyroscopical characteristics. Driving sta	lic and Slovakia. KZ actors on health bssibilities and s KZ alysis of texts. Di KZ y of the internati causes and cor KZ n engine charac Z,ZK istics. Longitudii	2 of workers. kills of man. 2 scussion on 2 2 conal relation sequences. 5 teristics - 3 nal dynamics
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616Y1KS	Quality and Reliability of Vehicles	KZ	2
	ility theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. K		
Mode and Effects	Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturying, Quality, Services) and other methods u	sed in industrial ar	pplications.
	Knowledge-based systems of quality and reliability, data collection.		
616Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
iviethoos of vehicle	production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measurem General principles of engine diagnostics.	ent. Transmission r	nechanism.
616Y1RE	Control and Electronic Vehicle Systems	КZ	2
	ts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadva	1	1
	control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control,	-	
	comfort systems.		
616Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles	s traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal trai	nsportation. Critica	I situation
	assesment. New materials in design. International standardization.		
616Y1ZG	Introduction into Applied Computer Graphics	KZ	2
	s, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour sche on, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basic		
general	graphics software.	51	
616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle costruction	h, aggregate computing, driving resistance, building and parameters of traction, constructional arrangement of personal cars, trucks,	buses, motorbikes	, legislation
	in the EU and in the world, creation of technical legislation, testing methods, vehicle tests, accelerated tests, mathematical modelling	j in testing.	
617FID	Financing and investment in transport	Z,ZK	4
	g of transport infrastructure, the role of public administration in the financing and realization of investment in transport, the investment		/cle, subsidy
	programs and their rules, competition, effectiveness and efficiency of spending public funds, evaluation systems of public projects an		
617GEDS Regional differe	Geography of Transport Systems ntiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional develo	KZ	eraction -
	hodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practica		
	analysis in transportation planning.		, , ,
617TEDL	Transport Technology and Logistics	KZ	3
	sport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in pasanger and freight tran		
	odus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their aplication us		1
617TGA	Graph Theory and its Applications in Transport	Z,ZK	4
	graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in o		· · · · · · · · · · · · · · · · · · ·
617X31	Project 1	Z	2
617X32	Project 2	Z	2
617X33	Project 3	Z	2
617Y1EV	Public Sector Economy ncial theory of public sector, public choice theory, externalites, decisions about public finance allocation, economic assesment of pub		
	R, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding fr		
617Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
-	ssenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial tran		-
	air cargo. Information systems in air transport. Global distribution systems.		
617Y1MD	Marketing in Transportation	KZ	2
General principles	of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport a	ind the resulting dif	fferences in
0473/405	the application of marketing.		
617Y1OF	Personal Finance budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of hous	KZ	
	financing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and		
,	(retirement savings and insurance).		.g
617Y1PM	Personnel Management	KZ	2
Human sour	ces, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, inter	cultural communic	ation.
617Y1SK	Urban and Regional Rail Transport Systems	KZ	2
-	transport demand, modal-split, distribution of passenger flows on public regional transport lines. Optimization of line management, li	-	-
evaluation of the	e timetable. Vehicle circulation creation. Optimizing driver shifts and arranging them in turnus. Effects of barrier-free and public transp	ort preferences. Th	ne role of
617Y1SL	marketing. Sociology of Human Resources	KZ	2
	and their importance, work group as a special kind of social group, communication, personal management, modern management, hum	1	
	of the organization.		rinig, cuitare
617Y1ST	Titan Simulation	KZ	2
	gement game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same produce	ct. Students set a	price and
determine the quar	ntity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences	s of their decisions	; by the form
0.000.00	of financial corporate reports and they use this information for other business decisions.		
618DKS			
Vibration of avatar	Dynamics of Structures and Systems	Z,ZK	4 al methods
-	ns with multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic consta	nts, other numerica	al methods.
-		nts, other numerica	al methods.
-	ns with multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic consta nuously distributed mass. Matrix form of equations of vibration. Finite element method in dynamics of structures. Solving vibrations by s	nts, other numerica	al methods.
Systems with contin 618KAD	ns with multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic consta nuously distributed mass. Matrix form of equations of vibration. Finite element method in dynamics of structures. Solving vibrations by s Subspace iteration methods. Introduction to nonlinear vibrations.	nts, other numerica superposition of nat	al methods. tural modes.
Systems with contin 618KAD Motion along a line	ns with multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic consta nuously distributed mass. Matrix form of equations of vibration. Finite element method in dynamics of structures. Solving vibrations by s Subspace iteration methods. Introduction to nonlinear vibrations. Kinematics and Dynamics	nts, other numerica superposition of nat Z,ZK s dynamics and sys	al methods. tural modes. 4 stem of point

618MTY	Materials Science and Engineering	Z,ZK	3
	terials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructu	,	ain attention
	the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and corr		
	to degradation processes in materials, to defectoscopy and to main mechanical tests.		
618NMM	Numerical Methods in Mechanics	Z	3
Basics of the mos	st used numerical methods in structural mechanics. Central difference method, finite element method, finite volume method, boundar	y element method.	Time and
spatial discretization	on schemes. Finite element method: derivation of the basic equations. Stiffness matrix, mass matrix, damping matrix for element and	structure. Methods	s for solving
	systems of algebraic equations. Numerical integration. Programming the FEM.		
618POM	Advanced Materials	KZ	2
The knowledge gai	ned in primary materials course is further developed. In greater physical detail it explains dynamics of strcture defects, phase diagram	ns of binary system	ns and other
concepts. Special	processes of structure control are discussed. The gained knowledge is utilized on description of contemporary technologies of materia	al production for ke	ey industrial
	applications.		
618PZP	Elasticity and Strength	Z,ZK	3
	ession. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted		
	ection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic fou		
618SAT	Structural Analysis	Z,ZK	4
-	of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate		-
Principle of virtual v	vork. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions.	Cross-sectional ch	aracteristics
	of planar shapes. Fiber polygons and chains.		
618TED	Technical Documentation	KZ	2
Technical standa	rds, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional	I and geometrical	accuracy,
	arrangement of drawing sheets.		
618TK	Theory of Structures	KZ	2
	ne, principle of virtual work. Force (flexibility) method. Aplication of force method to frame analysis. Displacement (stiffness) method. S		
method. Mathemat	ical foundations of elasticity. Static analysis of complex statically indeterminate structure. Energy methods for beam analysis. Lagrang	e variational princi	ple. Winkler
040)/4414	model of elastic foundation. Pasternak model of elastic foundation.	1/7	-
618Y1AM	Anatomy, Mobility and Safety of Man	KZ	2
-	natomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation	-	
and biomechanics	of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured n joint prostheses. Protective means and traffic safety regulations.	han and his treatm	ent. Human
		KZ	2
618Y1EM	Experimental Methods in Mechanics		-
	ole of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive i cedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fa	-	-
experimental pro	Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.	ligue and meanie p	
618Y1MT	Engineering Materials	KZ	2
	ew of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and	·	_
-		compositos, attor	nion lo pula
to Dioi	ogical materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's	selection charts.	
	ogical materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's Computer Simulations in Mechanics		2
618Y1PS	Computer Simulations in Mechanics	KZ	2 ptation of
618Y1PS Principles and o	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development	KZ elopment and adap	otation of
618Y1PS Principles and o	Computer Simulations in Mechanics	KZ elopment and adap	otation of
618Y1PS Principles and o geometry from oth	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model devier er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.	KZ elopment and adap	otation of
618Y1PS Principles and o geometry from oth 618Y1UK	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model devier er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor	KZ elopment and adap nditions and applica KZ	otation of ation of the 2
618Y1PS Principles and o geometry from oth 618Y1UK Basic characterist	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model devi er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems. Introduction of Rail Vehicles	KZ elopment and adap nditions and applica KZ in and unit trains. I	otation of ation of the 2 Rolling and
618Y1PS Principles and o geometry from oth 618Y1UK Basic characterist	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model devi- er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems. Introduction of Rail Vehicles ics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion tra	KZ elopment and adap nditions and applica KZ in and unit trains. I	otation of ation of the 2 Rolling and
618Y1PS Principles and o geometry from oth 618Y1UK Basic characterist	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model deve er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems. Introduction of Rail Vehicles ics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion tra tal running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - f	KZ elopment and adar nditions and applica KZ in and unit trains. F hydromechanic, hy	otation of ation of the 2 Rolling and
618Y1PS Principles and o geometry from oth 618Y1UK Basic characterist track resistance. To 620SYSA	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model deve er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems. Introduction of Rail Vehicles ics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion tra tal running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - I and electric drive. Design concept rail vehicles and drive of wheel set.	KZ elopment and adap nditions and applica KZ in and unit trains. F hydromechanic, hy Z,ZK	otation of ation of the 2 Rolling and drodynamic 5
618Y1PS Principles and o geometry from oth 618Y1UK Basic characterist track resistance. To 620SYSA Introduction to syst	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model deve er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems. Introduction of Rail Vehicles ics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion tra tal running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - I and electric drive. Design concept rail vehicles and drive of wheel set. Systems Analysis	KZ elopment and adap nditions and applica KZ in and unit trains. F hydromechanic, hy Z,ZK , processes, syster	tation of ation of the 2 Rolling and drodynamic 5 n behaviour
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618Y1PS Principles and o geometry from oth 618Y1UK Basic characterist track resistance. To 620SYSA Introduction to syst and its analysis, s 620UITS Terminology and le systems for ITS. Pr 620X31 620X32	Computer Simulations in Mechanics verview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model deve er CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary cor load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems. Introduction of Rail Vehicles ics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion tra tal running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - I and electric drive. Design concept rail vehicles and drive of wheel set. Systems Analysis em sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, strong functions and processes, genetic code, system identify, system architecture. Tools for system analysis - Petri nets, decision tak tasks. Soft and hard systems, methods for soft system analysis. Introduction to Intelligent Transport Systems gislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of informinciples and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples principles of ITS. Project 1 Project 2	KZ elopment and adaption KZ in and unit trains. If hydromechanic, hy Z,ZK processes, syster oles, algorithms for Z,ZK mation and telecon of possible applica Z	tation of the 2 Rolling and drodynamic 5 n behaviour structural 7 nmunication ations of the 2 2
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620Y1KP Communication and presentation skills	KZ	2
Motivation, priorities and their fulfillment, current communication networks, work with various sources, formal requirements of emails and final theses, ba		
teamwork, emotional intelligence, manipulation and way of working with it, coping with stressful situations, formal requirements of presentations, ways presentation, presentation skills, presentation skills in online environment.	s of communicatio	n during
620Y1LN Location and Navigation	КZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of road networks, localization on the network.	1	
transport connections, routing algorithms, their properties and implementation.		Ū
620Y1OI Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles,). Information systems and their components f		es, maps,
panels) and operators (cycles, location or current delay of vehicles,). The issue of tariff systems. Other examples of clearance syste		
620Y10K Road Lighting	KZ	2
Basic lighting quantities and terms, street lighting components (luminaires, control cabinets for street lighting, street lighting cables), characteristics of lumin light distribution), standards, measurement of illuminance and luminance in road lighting, tunnels, conceptual approach to street lighting design, lighting		-
Relux, street lighting control systems.		
620Y1PK Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, proc	esses, systems. A	framework
of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Ur	niform framework o	of standards
for systems management. Process management principles. Metrology and testing. Product certification.		
620Y1SC Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase ele		o-magnetic,
621Y1AM Aeronautical Information Management (AIM)	KZ	2
Definition and basic overview of AIS and AIM. Transition from AIS to AIM. Regulatory base. Provision of AIS/AIM in the Czech Rep. AIP (Aeronautical Inf	1	
the Czech Rep. AIRAC System. NOTAM messages.PIB (Pre-flight Information Bulletin). AIC (Aeoronautical Inf. Circulars). Aeronautical Charts. EAD (Eur		
(Quality Mng. System). ADQ (Aeronautical Data Quality). AIXM (Aeronautical Inf. Exchnage Format).		
621Y1BS Unmanned aircraft systems 1	KZ	2
Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Oper	rational risks and	operational
procedures. Practical flights.	KZ	2
621Y1LJ Aeronautical Radio and Flight Instruments Basic definitions, history of aircraft instrumentation, aerometric instrumentation, Earth magnetism, aircraft electric equipment, gyroscopic instrumentation,	1	2 Intation and
other aircraft equipment, engine instrumentation, warning and recording systems, instrumentation operational requirements, radiocommunication		
621Y1LS Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP	a ACC control. His	story of ATS
at USA and Czechoslovakia. ATS - Model of financing. Training System of Air Traffic Controllers. Future development of ATS.	·	
621Y1MP Matlab for project-oriented study	KZ	2
The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement		-
621Y1OH Airline Business and Operations	KZ	2
The course provides a comprehensive view of the commercial, operational and transportation activities of air transport companies. It focuses on the organiza		
various aspects of their strategy, economic and operational indicators. It introduces students in detail to operational processes and the essentials of transpo		•
a basic view of the economic aspects of air transport.		
621Y1PA Air Traffic Control Operating Procedures	KZ	2
Practical exercises on the ATC simulator with the following focus - getting familiar with the simulation environment, acquiring basic habits, aircraft identified		
level changes, ATC clearance, use of RNAV points. Practical exercises focused on the basis of vectoring, timely application of vertical spacing, EST and Exercises in the APPROACH airspace, arrivals, departures and conflict solutions.	REV message tra	ansmission.
621Y1PC ATC Procedures and Activities	KZ	2
Air traffic control procedures, basics of communication and phraseology, aircraft identification, spacing and traffic coordination. In addition, the course d	1	
the airports and low visibility operational procedures. Students will during the course learn basic safety management applications applied acros		
621Y1PL Operational Aspects of Aerodromes	KZ	2
Operational aspects of aerodromes. Location of aerodrome and orientation of runways. Requirements for apron. Capacity of airports runways and termi	-	nder winter
conditions. Firefighting units. Protection against unlawful interference. Local transport connection. Environmental protection.		
621Y1RZ Human Resources Management The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources manager	KZ	2 ovtornal
environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and rem		
dismissal and redundancies of employees. Education of employees. Planning career management.		, contorning,
621Y1SI ATC Simulator	KZ	2
Familiarization with the simulation environment, acquiring basic habits, aircraft identification procedures, vectoring, level changes, ATC clearance, use	e of RNAV points.	Practical
exercises focusing on basic vectoring, early application of vertical separation, EST and REV message passing. Practical exercises in the APPROACH	area, practicing a	rrival and
departure management procedures, conflict resolution.	1/7	
621Y1TH Aircraft Technical Handling Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-acing and anti-icing units. Loading and unloa	KZ Ading units Equipr	2 nent for
passangers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technic		
621Y1UL Aircraft Maintenance	KZ	2
Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and quali	· -=	
Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance	nance. Regulation	of director
EASA for aircraft maintenance. Seminars will be focused on practical application.		
621ZALD Basics of Air Transport	KZ	2
History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. V Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, groun		
Airlines and economics. Space technologies.		

622MEMT	Measurement Methods and Technology in Transportation	KZ	4
	thods in transport, their meaning and use;Geodetic basics in the Czech Republic; Angular, length and height measurements;Principle	es of mapping, ac	curacy and
errors of geode	tic measurements; Surveying and setting out; Challenges of localization, navigation and Global Navigation Satellite Systems; Laser sc	anning (terrestrial	, mobile,
	UAV);Technical photography and photogrammetry;Dynamic measurements of vehicles;High-speed cameras;		
622PRES	Road Traffic Accidents Prevention	KZ	4
Basic relation cau	ses - prevention, collision diagrams, causes of not giving way, initial speed and breaking influence on speed of impact, downhill grade	e, load transport a	nd fixation,
collisions with peo	lestrians, cyclists and motorcyclists, construction of vehicle breaks, winter conditions, inconvenient road parameters, visibility, anti-slic	le properties of ro	ad surface,
	solid barriers, assist systems, technical fault of vehicles.		
622UAN	Road Traffic Accidents Analysis Introduction	KZ	2
Important parame	ters of road infrastructure, typical vehicle dimensions, distance-time diagram, response time components, backward projection of acc	idental process, v	ehicle body
post-crash deform	ation, impact influence on passengers, video documentation, problem who was the driver, documentation, marks analysis, limits of a	ccidental analysis	, cornering,
	critical maneuvring, technical view hindrances, visibility and discriminability, nightfall.		
622X31	Project 1	Z	2
622X32	Project 2	Z	2
622X33	Project 3	Z	2
623Y1EH	Electronics and hardware in security of transportation	KZ	2
	ters of signals. Passive circuits, properties, basic measurements. Passive filters, semiconductors. Operational amplifiers, basic circui	ts, parameters. A	tive filters.
	gic circuits. AD converters. Connection of analog and digital parts. Basic blocks of digital signal processing. Measurement processing. D		
	in electronics.	0	
623Y1KB	Cyber security in transportation	KZ	2
Basic concepts of	security and cyber security, legal status in the field of cyber security, virtual cyberspace and communities, taxonomy of crimes in cyber	rspace, social im	pacts, social
engineerii	ng, cyber attack technology, information security, cyber attacks on telematics systems, security of systems with artificial intelligence, n	orms and standa	rds.
623Y1KM	Crisis Management	KZ	2
Theory and legal fr	ame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge c	n: theory and pos	ition of crisis
mana	gement and its targets; IZS-crisis management-crisis planning; and basic legislation. Practical part is concentrated to responsibility m	atrix compilation.	
623Y1KO	Quantum Physics and Optoelectronics	KZ	2
	Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics compon	ents.	1
623Y1MK	Crisis Situation Management in Critical Infrastructure	KZ	2
	ritical infrastructute elements on all levels, their protection systems, responsibilities of particular agencies of the state administration a	and the self-gover	nment, and
	responsibilities to anounce particular safety provisions. Physical and cyber protection of critical infrastructure with special attention to		,
623Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
	ical systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safel		
,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,	infrastructures.		
623Y1VS	Negotiation and Cooperation	KZ	2
	r negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Information		in the team.
	ation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specific		
	trust.		-
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
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