Study plan

Name of study plan: AUT bak.prez.11/12

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: 131

The role of the block: Z

Code of the group: 1.S.BP 10/11

Name of the group: 1.sem.bak.prez.10/11

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 12 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
13E	Economics	Z,ZK	3	2+1	Z	Z
11GIE	Geometry Old ich Hykš, Pavel Provinský, Šárka Vorá ová Old ich Hykš Old ich Hykš (Gar.)	KZ	3	2P+2C+12B	Z	Z
14KSP	Constructing with Computer Aid Martin Brumovský, Martin Fiala, Radek Kratochvíl, Lukáš Svoboda, Jan Vogl, Drahomír Schmidt Lukáš Svoboda Drahomír Schmidt (Gar.)	KZ	2	0P+2C+8B	Z	Z
11LA	Linear Algebra Pavel Provinský, Lucie Kárná, Martina Be vá ová Martina Be vá ová Martina Be vá ová (Gar.)	Z,ZK	3	2P+1C+10B	Z	Z
11MTA	Mathematical Analysis	Z,ZK	4	2+2	Z	Z
18MRI1	Materials 1	Z,ZK	3	2+1	Z	Z
00TVC1	Physical Education 1	Z	1	0+2	Z	Z
18TTED	Creation of Technical Documentation	KZ	2	2+1	Z	Z
22UN	Traffic Accidents Introduction	Z	2	2+0	Z	Z
12ZADI	Introduction to Transportation Engineering	Z,ZK	3	2+1	Z	Z
14ZINF	Fundamentals of Informatics	KZ	2	0+2	Z	Z
21ZLD	Introduction to Air Transport	KZ	2	2+1	Z	Z

Characteristics of the courses of this group of Study Plan: Code=1.S.BP 10/11 Name=1.sem.bak.prez.10/11

13E	Economics	∠,∠K	3				
Microeconomic and r	Microeconomic and macroeconomic interpretation of economic relations. Method and subject of the economics. Economic decision making of consumers and producers. Market						
structures. Labour an	structures. Labour and capital, efficiency, ownership, public choice.						
11GIE	Geometry	KZ	3				
Differential geometry	of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajector	y of the motion, th	ne velocity, and				
acceleration of a part	icle moving on a curved path.						
14KSP	Constructing with Computer Aid	KZ	2				
"CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications							
and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment							
profiles drawings with raster foundaments)							

11LA	Linear Algebra	Z,ZK	3
Vector spaces (line	ear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations	and their solvability. D	eterminants an
their applications.	Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.		
11MTA	Mathematical Analysis	Z,ZK	4
Sequences and se	eries of real numbers and its convergence. Basic properties of functions. Differential and integral calculus of the real function of c	one real variable. Powe	er series, Fourie
series and foundat	tions of Fourier transform.		
18MRI1	Materials 1	Z,ZK	3
•	Basics of thermodynamics of metals and their alloys. Balanced binary diagrams. Alloys of iron with carbon. Deterioration of solins. Physical features. Mechanical features. Dephectostopic testing. Corosion.	id solutions. Heating p	rocessing of
00TVC1	Physical Education 1	Z	1
Practical instructio	on and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Include	ed are: basketball, volle	eyball, soccer,
tennis, squash, flo	porball, bodybuilding, swimming, canoeing, aerobic.		
		1/7	2
18TTED	Creation of Technical Documentation	KZ	2
-	Creation of Technical Documentation ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or		_
Technical standard			_
Technical standard	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or		_
Technical standard arrangement of dra 22UN	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, cawing sheets, types of schemes and their creation.	dimensional and geom	etrical accurac
Technical standard arrangement of dra 22UN Traffic accident as	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, cawing sheets, types of schemes and their creation. Traffic Accidents Introduction	dimensional and geom	etrical accuracy
Technical standard arrangement of dra 22UN Traffic accident as	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, cawing sheets, types of schemes and their creation. Traffic Accidents Introduction a physical process, systematic submission, vehicle x human x infrastructure interaction, accidents statistics, aircraft accidents	dimensional and geom	etrical accuracy
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, cawing sheets, types of schemes and their creation. Traffic Accidents Introduction Traffic Accidents Introduction	dimensional and geom	etrical accuracy 2 s, accidents on
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or awing sheets, types of schemes and their creation. Traffic Accidents Introduction Traffic Accidents Introduction	dimensional and geom	etrical accuracy 2 s, accidents on
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI Traffic survey. Terre	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or awing sheets, types of schemes and their creation. Traffic Accidents Introduction Traffic Accidents Introduction	dimensional and geom	etrical accuracy 2 s, accidents on
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI Traffic survey. Terror Traffic and environ 14ZINF	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or the same standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or the same standardization, the same standardization of technical objects, technical diagrams and charts, or the same standardization of technical objects, technical diagrams and charts, or the same standardization of the same standardization of the same standardization, accidents statistics, aircraft accidents raffic accidents, other aspects, accidental prevention. Introduction to Transportation Engineering restrial roads. Residential zone. Land - use planning. Railway transport. Public mass transport. Integrated traffic systems. Traffic ment.	dimensional and geom Z s, accidents on railway Z,ZK rorognosis. Traffic safe	etrical accuracy 2 s, accidents on 3 ety. Air transpor
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI Traffic survey. Terror Traffic and environ 14ZINF Introduction to face	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or the same standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or the same standardization, the same standardization of technical objects, technical diagrams and charts, or the same standardization of technical objects, technical diagrams and charts, or the same standardization of technical objects, technical diagrams and charts, or the same standardization, the same standardization of the same standardization, the same standardization of the same standardization of the same standardization, the same standardization, the same standardization of the same standardization, the same standardization of the same standardization of the same standardization of the same standardization of the same standardization, the same standardization of the same standardization	dimensional and geom Z s, accidents on railway Z,ZK prognosis. Traffic safe	etrical accuracy 2 s, accidents on 3 ety. Air transpor 2 acl. arithmetic
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI Traffic survey. Terror Traffic and environ 14ZINF Introduction to face	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or awing sheets, types of schemes and their creation. Traffic Accidents Introduction	dimensional and geom Z s, accidents on railway Z,ZK prognosis. Traffic safe	etrical accuracy 2 s, accidents on 3 ety. Air transpor 2 acl. arithmetic
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI Traffic survey. Terror Traffic and environ 14ZINF Introduction to facical calculations. Algor	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or awing sheets, types of schemes and their creation. Traffic Accidents Introduction	dimensional and geom Z s, accidents on railway Z,ZK prognosis. Traffic safe	etrical accuracy 2 s, accidents on 3 ety. Air transpor 2 ncl. arithmetic
Technical standard arrangement of dra 22UN Traffic accident as waterways, road tr 12ZADI Traffic survey. Terror Traffic and environ 14ZINF Introduction to fact calculations. Algor graphs, calculation 21ZLD	ds, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, or awing sheets, types of schemes and their creation. Traffic Accidents Introduction	Z,ZK c prognosis. Traffic safe KZ cn. Number systems in production. Work with Microscopic and the systems in production. WZ	etrical accuracy 2 s, accidents on 3 ety. Air transpor 2 ncl. arithmetic S-Excel - tables

Code of the group: 2.S.BP 10/11

Name of the group: 2.sem.bak.prez.10/11

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 12 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
13EDOT	Economy, Transport, Telecommunications	KZ	2	2+0	L	Z
11FY1	Physics 1	Z,ZK	4	2P+2C	L	Z
11MVP	Mathematical Analysis of Function of More Variables	Z,ZK	3	2+2	L	Z
18MRI2	Materials 2	KZ	2	2+0	L	Z
11PT	Probability	Z	2	1+1	L	Z
12PKD	Rail Transport Designing	Z,ZK	3	2+2	L	Z
14SIAP	Networks and Protocols	KZ	2	1+1	L	Z
18ST	Statics	Z,ZK	3	2+1	L	Z
17TDL	Transport Technology and Logistics	Z,ZK	3	2+2	L	Z
00TVC2	Physical Education 2	Z	1	0+2	L	Z
20UIS	Introduction to ITS	Z,ZK	3	2+1	L	Z
14UPRO	Introduction to Programming	KZ	2	0+2	L	Z

Characteristics of the courses of this group of Study Plan: Code=2.S.BP 10/11 Name=2.sem.bak.prez.10/11

13EDOT	Economy, Transport, Telecommunications	KZ	2			
Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability.						
11FY1	Physics 1	Z,ZK	4			
Kinematics, particle	dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric	current.				
11MVP	Mathematical Analysis of Function of More Variables	Z,ZK	3			
Metric spaces, sequ	ences in metric spaces, limit of sequence in metric space. Differential calculus of functions of several variables, differential of fur	nction, partial deri	vations, implicitly			
defined functions, extremes of functions of several variables. Integral calculus of functions of several variables, Riemann integral, integral over curves and surfaces in R3, application						
of integral calculus in physics.						
18MRI2	Materials 2	KZ	2			
Fundamental concepts notions The main materials groups. Semiconductors, Polymers, Special types of steel, Properties and application of the composite materials						

11PT Probability Descriptive statistics. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability distribution, probability mass and density, moments, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. Mixed distributions, mixture of distributions. Law of large numbers, central limit theorem Rail Transport Designing Railway lines network. Vehicle and track relation. Traction. Track geometrical parameters. Clearance profile. Railway lines routing. Superstructure and substructure of the railway lines. Switches. Railway stations. City rail transport. 14SIAP ΚZ Networks and Protocols Basic communication model, history and development of the Internet, principle of data transfer through computer networks (TCP/IP), performance of basic network protocols (ARP, RARP, TCP, UDP, Telnet, FTP, DNS, DHCP POP3, IMAP), data acquirement from the Internet sources, communicating ability via the Internet and fundamentals of own web presentation 18ST Statics Z,ZK General system of forces. Calculation of reactions of mass objects and compound systems. Assessment of internal forces on statically determinate beam and simple framework. Principle of virtual works. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction, method of joints and method of sections. Geometry of cross sections. Plane fiber polygons and catenary cables. Transport Technology and Logistics Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in pasanger and freight transport. Organisation of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city transport. Logistic technologies and their application using various transport means Physical Education 2 Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic. 20UIS Z,ZK 3 Introduction to ITS Intelligent Transport Systems (ITS), their objectives and vision. ITS in the world, in Europe and in the Czech Republic. Architecture of ITS and the role of standardization. Information

and navigation systems. ITS in road, rail and combine transport. Design of ITS, organization, preparation and implementation of the project. Current projects in the Czech Republic.

Introduction to Programming Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays,

Code of the group: 3.S.BP 11/12

functions), programming techniques, complexity.

Name of the group: 3.sem.bak.prez.11/12

Requirement credits in the group: In this group you have to gain 27 credits

Requirement courses in the group: In this group you have to complete 10 courses

Credits in the group: 27 Note on the group:

safety and fluency.

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
11DAD	Differential and Difference Equations	Z,ZK	3	2+1	Z	Z
11FY2	Physics 2	Z,ZK	4	2+2	Z	Z
12MDE	Transport Models and Transport Excesses Milan Dont, Josef Kocourek	Z,ZK	3	2P+1C+8B	Z	Z
12PPOK	Designing Roads, Highways and Motorways Josef Kocourek, Petr Šatra, Tomáš Pad lek, Petr Kumpošt	KZ	3	1P+2C+10B	Z	Z
18PZP	Elasticity and Strength Jan Vy ichl, Jitka ezní ková, Daniel Kytý, Jan Šleichrt, Tomáš Doktor, Tomáš Fíla, Nela Kr má ová, Jan Falta, Radim Dvo ák,	Z,ZK	3	2P+1C+10B	Z	Z
11SIS	Statistics	Z,ZK	2	1+1	Z	Z
20SSA	Systems Analysis	Z,ZK	3	2+1	Z	Z
14UATT	Introduction to Automatization and Telecommunication Systems	KZ	2	3+0	Z	Z
16UDDM	Introduction to Transportation and Manipulation Technics	ZK	2	2+0	Z	Z
14ZAET	Fundamentals of Electrotechnics	KZ	2	2+1	Z	Z

Characteristics of the courses of this group of Study Plan. Code=3.5.BF 11/12 Name=5.5em.bak.prez.11/12							
11DAD	Differential and Difference Equations	Z,ZK	3				
Difference equations	Difference equations and its systems. Some solvable types of differential equations of the first order. Linear differential equations of the n-th order. Methods for solution of the homogeneous						
equation, solution of i	nhomogeneous equation by means of variation of constants. Power series and their use for solution of differential equation. Bound	dary value problen	n. Eigennumbers				
and function for differ	ential equation. Fourier series of function.						
11FY2	Physics 2	Z,ZK	4				
Magnetic field, electro	omagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-ele	ectron atoms, the	nuclei. Basics of				
solid body physics.							
12MDE	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 queues, shock waves. Quality of							
transport and its assessment. Statistical characteristics of transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport							

12PPOK Designing Roads, Highways and Motorways Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections. 18PZP Elasticity and Strength Tension and compression. Bending of beam. Shear stress in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joints of structures. Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability. **11SIS** Z,ZK Point estimation, properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression, use of matrices in regression. Systems Analysis Systems identification. Typical tasks of systems analysis: on the interface, routes in system, decomposition and integration, on systems feedback. Capacity tasks, process analysis. Task about behaviour, aim behaviour, the genetic code, architecture and identity of systems. Fundamentals of technical cybernetics, stability and reliability of systems 14UATT Introduction to Automatization and Telecommunication Systems Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transportation, modelling and projecting of transport systems, integrated technological and infromation system in post, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedial networks and services, NGN networks. Introduction to Transportation and Manipulation Technics Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislature. 14ZAET Fundamentals of Electrotechnics K7 2 Basic electrotechnic terms, circuit quantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assignating of bipoles and basic circuit elements. Solution to direct current circuits with a help of circuit analysis elementar methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triplangel

Code of the group: 5.S.BAUT 12/13

and principle of superposition in direct current circuits.

Name of the group: 5.sem.AUT bak.prez. 12/13

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 7 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
14DB	Database Systems	KZ	2	0+2	Z	Z
14IFSD	Information Systems in Transportation	KZ	2	2+0	Z	Z
14SE	High Voltage Electrical Engineering	KZ	2	2+0	Z	Z
14TSJ	Communication Technologies	Z	2	2+0	Z	Z
14TC	Telecommunications	Z,ZK	3	2+2	Z	Z
17TGA	Graph Theory and its Applications in Transport Alena Rybi ková, Denisa Mocková, Dušan Teichmann	Z,ZK	4	2P+2C+12B	Z	Z
20ZC	Base of Digital Technique	Z,ZK	3	2+1	Z	Z

Characteristics of the courses of this group of Study Plan: Code=5.S.BAUT 12/13 Name=5.se	em.AUT bak.prez. 12/13	
14DB Database Systems	KZ	2
Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database	ase design, security and integrity of dat	a, database
queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to database systems.	a via the WWW.	
14IFSD Information Systems in Transportation	KZ	2
Transportation demands, IS types for transport area, common IS structures. Continuous and discrete simulation. Visualization,	coding and encryption, secured vs. ope	n comminication
channel. Optimizing by help of GA. Theory of games, Paret selections. IS's life cycle. Legal frame of IS at transportation. Government of the cycle	rnement IS. Development of secure and	relevant ISs at
transportation. Real time operating IS. IS certification and validation.		
14SE High Voltage Electrical Engineering	KZ	2
Three-phase system, single- and three-phase transformer, automatic transformer, electromagnet (solenoid), direct current gen	erator and overview of types, direct cur	rent motor and
overview of types, alternate current motors, rotary magnetic field of three-phase winding, synchronous and asynchronous (inde	uction) motor, alternate current generate	or (alternator).
14TSJ Communication Technologies	Z	2
Technology of post shipment submission, transport, and delivery in physical and electronic way, virtual post operation. Technology	ogy of information transmission via elec	tronic way,
application of new information and communication technologies in an offer of permanent, mobile, and NGN e-communication ne	tworks, solution to e-communication ne	twork interfaces,
technological principles of end telecommunication devices.		
14TC Telecommunications	Z,ZK	3
Introduction of present stage and new trends in telecommunications systems. Legal conditions for telecommunications service	s provisioning and applications are intro	duced.
Telecommunications key elements applied in hierarchical architecture are introduces and relations between networks elements parai	meters and performance of the whole tele	communications
systems are explained in context with their typical applications in the transportations systems.		
17TGA Graph Theory and its Applications in Transport	Z,ZK	4
Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routin	g, use of graphs in other scientific disci	plines.
20ZC Base of Digital Technique	Z,ZK	3
Introduction to logical systems. Design of combinational and sequential logic circuits. Computer architecture - von Neumann conc	ept, RISC architecture. Processor, comp	uter arithmetics,

controller, memories, instruction set, base cycle of computer. Digital circuits, A/D and D/A converters. One-chip microcontrollers. Programmable logical circuits - FPGA, CPLD. Displays.

Code of the group: 5.S.BAUT VÝB R 12/1

Name of the group: 5.sem.AUT výb r p edm tu 12/13

Requirement credits in the group: In this group you have to gain 5 credits

Requirement courses in the group: In this group you have to complete 2 courses

Credits in the group: 5 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
14CAD2	CAD 2	KZ	2	0+2	Z	Z
14CA	CAx Systems	KZ	3	1+2	Z	Z
14OS2	Operating Systems 2	KZ	2	0+2	Z	Z
20ZTH	Railway Interlocking Plants	KZ	3	2+1	Z	Z

Characteristics of the courses of this group of Study Plan: Code=5.S.BAUT VÝB R 12/1 Name=5.sem.AUT výb r p edm tu 12/13

ΚZ Introduction to different approaches at parametric and adaptive modelling. Sketch drawing with a help of geometric relations and parametric dimensions. Theory of work in working planes, axes, and points frameworks. Parts and assemblies modelling, possibilities of adaptive modelling. Creation of presentations and drawings

14CA ΚZ 3 CAx Systems Programming tools for development of CAx applications superstructures and user interfaces, systems openness, use of C/C++, VBA, and LISP languages, possibilities of scripts and cooperation with spreadsheet programs, relation to database systems.

14OS2 Operating Systems 2 2 Domains and workgroups in MS Windows, users and their rights, configuration of networks (NFS, Samba, Firewall, FTP, http, DHCP, DNS), Windows register, remote deskttop,

configuration files, programming - networking, threads.

Railway Interlocking Plants Characteristics of components and parts of interlocking plants for control and command of railways transport. Rail transport; standards and principles of rail security. I., II. and III. categories of interlocking plants and future technologies. Components for interlocking plants. Compatibility and interoperability. Data security. Situation in the Czech Republic and in the world. Intelocking plants in public transport in cities.

Code of the group: 6.S.BAUT 12/13

Name of the group: 6.sem.AUT bak.prez. 12/13

Requirement credits in the group: In this group you have to gain 17 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 17 Note on the group:

20ZTH

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
20BAS	Safety and Reliability of Systems	KZ	2	2+0	L	Z
14DM	Datamining	KZ	2	2+0	L	Z
17DAS	Transportation and Communication Law	Z	1	2+0	L	Z
13ERP	Company Economy and Management	Z,ZK	3	2+1	L	Z
14ISYS	Information Systems	KZ	2	2+0	L	Z
14RVD	Robotics in Transportation	Z,ZK	3	2+2	L	Z
14TLSY	Telecommunication Systems	Z,ZK	4	2+2	L	Z

Characteristics of the courses of this group of Study Plan: Code=6.S.BAUT 12/13 Name=6.sem.AUT bak.prez. 12/13

	20BAS	Safety and Reliability of Systems	KZ	2				
	Basic concepts of safety and reliability in transport and its application. Basic scheme and the types of diagnostic systems. Acceptability and reliability of prediction. The sensitivity of							
	transport and sensitivity analysis. Neural networks and optimization algorithms. Human factors in transport. Human - system interaction. Testing of the simulator operator and testing							
in real situations.								
	14DM	Datamining	KZ	2				
	Types of data sources and acquired knowledge, data stores and OLAP technology for knowledge acquiring from data, data preprocessing at knowledge acquiring process, datamining							

systems, classes characteristics mining, mining of asocial rules from data stores and databases, classification (decision-making tree, Bayes classification, use of neuron networks). Prediction. Cluster analysis. Mining in complex structured data, multimedial dbf, www.

17DAS	Transportation and Communication Law	Z	1					
Transportation and com	munication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent.							
13ERP	Company Economy and Management	Z,ZK	3					
Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment								

appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan.

14ISYS Information Systems State-of-the-art tools of objects control (control and planning) including problems related to these toole use, theory of information and knowledge, knowledge and expert systems, IS planning methodologies, transaction systems, theory of computer networks, semantic webs and sensitivity analysis.

14RVD Z,ZK Robotics in Transportation 3

Understanding the following topics: robot and industrial manupulator, classification, mobile robot. Robot kinematics, co-ordinate systems. Special robot sensors. Action members, transmissions. Tactile recognition, woring head. Industrial robots' control systems. Spatial orientation. Visual information processing. Mobile robots. Particularities of mobile robot control systems. Artificial intelligence in robotics. Reactive systems

14TLSY Z,ZK Telecommunication Systems

Characteristics of metallic and fiber lines, network passive and active elements. Physical layer design tools. Terrestrial and wireless (fixed and mobile) systems - network architecture. Most frequently used protocols, their properties and mutual relations. Protocols application in e-communications systems for data and voice services and support of the ITS systems.

Code of the group: 6.S.BAUT VÝB R 12/13

Name of the group: 6.sem.AUT výb r p edm tu 12/13

Information Systems Security Standards

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 at least 1 course (at most 2)

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
14SBIS	Information Systems Security Standards	KZ	2	2+0	L	Z
20TZ	Technology of Control of the Railway Traffic Systems	ZK	2	2+0	L	Z
14VZ	3D Vizualization	Z,ZK	4	2+2	L	Z

Characteristics of the courses of this group of Study Plan: Code=6.S.BAUT VÝB R 12/13 Name=6.sem.AUT výb r p edm tu 12/13

	14000	information Systems Security Standards	112	
Security, reliability, accessibility and servicebility of information systems. Physical versus information security, open versus closed system. Basic principles of security and threats information systems. Security of information systems - standards, development of standards, application of standards. 20TZ Technology of Control of the Railway Traffic Systems ZK 2			and threats for	
	information systems. Se	curity of information systems - standards, development of standards, application of standards.		
	20TZ	Technology of Control of the Railway Traffic Systems	ZK	2
	Legislation in the railway	transport. Technological process of rail transport control. Service and technology of control. Regional Railways. Rail communi	cation equipment.	. Rail information

systems. Fundamentals of rail control. Application of train driving automation.

Z,ZK

3D Vizualization Description and principles of 3D modelling. Basic 3D primitiva and basic modification and transformation functions. SW tools for 3D visualization. Creation of 3D scene. Modification and combination of 3D primitiva. Decsription of planes and work with them. Use of material editors and work with textures. Illumination of 3D scenes, setup of luminous and material parameters. Application of cameras for scanning. Rendering and animations creation.

Name of the block: Semestrální projekt Minimal number of credits of the block: 6

The role of the block: ZP

14VZ

Code of the group: XP4,5,6 11/12

Name of the group: Projekty prez.4.5.6.sem.11/12

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
15X31	Project 1	Z	2	0P+1C	L	ZP
14X31	Project 1	Z	2	0P+1C	L	ZP
13X31	Project 1	Z	2	0+1		ZP
12X31	Project 1	Z	2	0P+1C	L	ZP
11X31	Project 1	Z	2	0P+1C	L	ZP
23X31	Project 1	Z	2	0P+1C	L	ZP
17X31	Project 1 Alena Rybi ková, Denisa Mocková, Dušan Teichmann, Roman Št rba, Milan K íž, Václav Baroch, Daniel Pilát, Michal Drábek, Alexandra Dvo á ková, Václav Baroch (Gar.)	Z	2	0P+1C	L	ZP
18X31	Project 1	Z	2	0P+1C	L	ZP

20X31	Project 1	Z	2	0P+1C	L	ZP
21X31	Project 1 Jakub Kraus, Andrej Lališ, Jakub Hospodka, Slobodan Stoji, Lenka Hanáková, Terézia Pilmannová, Peter Vittek, Natalia Guskova, Kate ina Grötschelová,	Z	2	0P+1C	L	ZP
22X31	Project 1	Z	2	0P+1C	L	ZP
16X31	Project 1	Z	2	0P+1C	L	ZP
15X32	Project 2	Z	2	0P+2C	Z	ZP
14X32	Project 2	Z	2	0P+2C	Z	ZP
13X32	Project 2	Z	2	0+2		ZP
12X32	Project 2	Z	2	0P+2C	Z	ZP
11X32	Project 2	Z	2	0P+2C	Z	ZP
16X32	Project 2 Petr Bouchner, Tereza Kunclová	Z	2	0P+2C	Z	ZP
23X32	Project 2	Z	2	0P+2C	Z	ZP
22X32	Project 2	Z	2	0P+2C	Z	ZP
21X32	Project 2 Jakub Kraus, Andrej Lališ, Jakub Hospodka, Slobodan Stoji , Lenka Hanáková, Terézia Pilmannová, Peter Vittek, Natalia Guskova, Lukáš Popek,	Z	2	0P+2C	Z	ZP
20X32	Project 2	Z	2	0P+2C	Z	ZP
18X32	Project 2	Z	2	0P+2C	Z	ZP
17X32	Project 2 Alena Rybi ková, Denisa Mocková, Dušan Teichmann, Andrea Hrní ková, Milan K íž, Václav Baroch, Daniel Pilát, Michal Drábek, Alexandra Dvo á ková,	Z	2	0P+2C	Z	ZP
11X33	Project 3	Z	2	0P+1C	L	ZP
12X33	Project 3 Josef Kocourek, Tomáš Pad lek, Dagmar Ko árková	Z	2	0P+1C	L	ZP
13X33	Project 3	Z	2	0+1		ZP
14X33	Project 3	Z	2	0P+1C	L	ZP
15X33	Project 3	Z	2	0P+1C	L	ZP
23X33	Project 3	Z	2	0P+1C	L	ZP
21X33	Project 3 Andrej Lališ, Slobodan Stoji , Lenka Hanáková, Terézia Pilmannová, Lukáš Popek, Iveta Kameníková, Milan Kameník, Marek Šudoma, Viktor Valenta,	Z	2	0P+1C	L	ZP
20X33	Project 3	Z	2	0P+1C	L	ZP
18X33	Project 3	Z	2	0P+1C	L	ZP
17X33	Project 3 Alena Rybi ková, Denisa Mocková, Dušan Teichmann, Roman Št rba, Milan K íž, Václav Baroch, Daniel Pilát, Michal Drábek, Alexandra Dvo á ková, Václav Baroch (Gar.)	Z	2	0P+1C	L	ZP
16X33	Project 3	Z	2	0P+1C	L	ZP
22X33	Project 3	Z	2	0P+1C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=XP4,5,6 11/12 Name=Projekty prez.4.5.6.sem.11/12

15X31	Project 1	Z	2
14X31	Project 1	Z	2
13X31	Project 1	Z	2
12X31	Project 1	Z	2
11X31	Project 1	Z	2
23X31	Project 1	Z	2
17X31	Project 1	Z	2
18X31	Project 1	Z	2
20X31	Project 1	Z	2
21X31	Project 1	Z	2
22X31	Project 1	Z	2
16X31	Project 1	Z	2
15X32	Project 2	Z	2
14X32	Project 2	Z	2
13X32	Project 2	Z	2
12X32	Project 2	Z	2
11X32	Project 2	Z	2
16X32	Project 2	Z	2
23X32	Project 2	Z	2
22X32	Project 2	Z	2
21X32	Project 2	Z	2

20X32	Project 2	Z	2
18X32	Project 2	Z	2
17X32	Project 2	Z	2
11X33	Project 3	Z	2
12X33	Project 3	Z	2
13X33	Project 3	Z	2
14X33	Project 3	Z	2
15X33	Project 3	Z	2
23X33	Project 3	Z	2
21X33	Project 3	Z	2
20X33	Project 3	Z	2
18X33	Project 3	Z	2
17X33	Project 3	Z	2
16X33	Project 3	Z	2
22X33	Project 3	Z	2

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 21

The role of the block: P

Code of the group: 4.S.BAUT 11/12

Name of the group: 4.sem.AUT bak.prez.11/12

Requirement credits in the group: In this group you have to gain 21 credits

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

Credits in the group: 21 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
14ANM	Numerical Methods Application	Z,ZK	3	2+2	L	Р
14CAD1	CAD 1	KZ	2	0+2	L	Р
14ELN	Electronics	Z,ZK	3	2+1	L	Р
18KIAD	Kinematics and Dynamics	Z,ZK	2	2+1	L	Р
11MDS	Collection and Processing of Traffic Data	KZ	2	2P+0C	L	Р
11MSP	Modeling of Systems and Processes Lucie Kárná, Bohumil Ková, Jana Kuklová Jana Kuklová Bohumil Ková (Gar.)	Z,ZK	4	2P+2C+12B	L	Р
14OJM	Object Oriented Modelling	Z,ZK	3	2+1	L	Р
14OS1	Operating Systems 1	KZ	2	0+2	L	Р
20TRS	Control Theory	KZ	2	2+0	L	Р

Characteristics of the courses of this group of Study Plan: Code=4.S.BAUT 11/12 Name=4.sem.AUT bak.prez.11/12

14ANM	Numerical Methods Application	Z,ZK	3
Numerical methods and	their application, implementation of vectors and matrices in C/C++ using STL library, linear equation system solving, interpol	ating, approximati	on, numerical
derivative and integration	n, differential equation solving, stability of methods.		
14CAD1	CAD 1	KZ	2
Modelling principles and	techniques in non-parametric modeller (AutoCAD), Boolean operations, planar vs. volumetric objects. Illuminated scenes - ligh	it types and illumir	nation methods.
Creation and use of ma	terials for 3D objects. Ways of texture mapping. Final models rendering.		
14ELN	Electronics	Z,ZK	3
Semiconductor diodes a	and thyristor and their applications. Transistors, their basic connecting and applications. Operational amplifiers, their linear and	l non-linear applic	ations and
frequency characteristic	s. Passive and active frequency filters. AD and DA converters.		
18KIAD	Kinematics and Dynamics	Z,ZK	2
Motion along a line, mot	ion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point ma	iss dynamics and	system of point
masses, equation of mo	tion. Method of Newton. Princle of D'Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impa	ct theory. Introduc	tion to the
solution of vibration with	multiple degrees of freedom.		
11MDS	Collection and Processing of Traffic Data	KZ	2
Basic principles of traffic	c detection and data collection, specific problems of the field of traffic data. Data preprocessing and analysis for use in additio	nal applications.	
11MSP	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 diffi	erential and differe	ntial equations.
Linear and nonlinear sy	stem, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function	. Stability of LTI s	ystems.
Discretization of continu	ous systems. System interconnection.		

14OJM Object Oriented Modelling
Fundamentals of object oriented SW development, fundamentals of object oriented approach. Explanation of basic classes, polymorphism, inheriting, complementation. Modelling fundamnetals in UML. Principles and processing use case diagrams, sequention diagrams, classes and states diagrams. Use of CASE tools for complex analysis. Usability of OM and process modelling.

14OS1 Operating Systems 1

OS, their function and architecture, process and memory management, virtual memory, threads, interprocess communication, synchronizzation, file systems, architecture of OS Windows and Linux, start of PC and OS, networking, safety in S, terminals in MS Win and Linux, batch files.

20TRS Control Theory

Introduction to theory systems, linear, non-linear and causal systems. Signal theory, regulation circuits and regulators. Stability and criteria of stability. Management, principles of

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 10

The role of the block: PV

Code of the group: Y1-BAUT 11/12

feedback management. Adaptive and expert management.

Name of the group: PVP bak.prez. AUT od 11/12

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 5 courses

Credits in the group: 10

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
17Y1AF	Alternative Forms of Transportation Project Financing	KZ	2	2+0	Z	PV
18Y1AM	Anatomy, Mobility and Safety of Man Jitka Jirová	KZ	2	2P+0C	Z	PV
14Y1AV	Animation and Visualization	KZ	2	2P+0C	L	PV
14Y1AP	Automatization in Mail	KZ	2	2+0	Z	PV
17Y1BB	Banks and Banking	KZ	2	2+0	Z	PV
14Y1BE	Barrierless Transport	KZ	2	2P+0C	L	PV
15Y1BO	Work Safety and Health Protection in Transportation Petr Musil, Eva Rezlerová	KZ	2	2P+0C	L	PV
15Y1DU	History of Art and Society	KZ	2	2+0	Z	PV
15Y1DZ	History of Railway Eva Rezlerová, Martin Jacura	KZ	2	2P+0C	L	PV
17Y1DZ	Transported Commodities Cognization	KZ	2	2+0	L	PV
18Y1D1	Dynamics of Routes and Vehicles 1	KZ	2	2+0	Z	PV
13Y1EA	Economic - Energetic Analysis of Land Transport	KZ	2	2+0	Z	PV
13Y1EV	Public Sector Economy	KZ	2	2+0	Z	PV
17Y1EV	Public Sector Economy Veronika Faifrová	KZ	2	2P+0C	Z	PV
15Y1EH	European Integration within Historical Context Jan Feit	KZ	2	2P+0C	Z	PV
18Y1EV	Experimental Methods and Numerical Modelling	KZ	2	2+0	L	PV
15Y1FD	French Area Studies and Transportation	KZ	2	2P+0C	L	PV
20Y1GI	Geographical Information Systems	KZ	2	2+0	L	PV
14Y1GD	GIS and Maps Digitalization	KZ	2	2+0	Z	PV
14Y1HW	Computer Hardware	KZ	2	2P+0C	L	PV
15Y1HL	History of Civil Aviation Eva Rezlerová, Vladimír Plos	KZ	2	2P+0C	L,Z	PV
15Y1HD	History of City Mass Transport Milan Dont, Eva Rezlerová	KZ	2	2P+0C	Z	PV
12Y1HD	Traffic Noise Dagmar Ko árková, Libor Ládyš	KZ	2	2P+0C	L	PV
15Y1HE	Work Hygiene and Ergonomics in Traffic Petr Musil, Eva Rezlerová	KZ	2	2P+0C	Z	PV
20Y1IC	Human Machine Interaction	KZ	2	2+0	L	PV
16Y1KJ	Railroad Vehicles	KZ	2	2+0	L	PV
12Y1KN	Combined Transportation Petr Nejedlý	KZ	2	2P+0C	Z	PV
20Y1K	Cybernetics	KZ	2	2+0	Z	PV

21Y1LM	Aviation Meteorology	KZ	2	2+0	L	PV
21Y1LR	Radio Technology in Aviation	KZ	2	2+0	L	PV
21Y1L	Airports - Design and Operation	KZ	2	2+0	L	PV
21Y1LC	Human Factor	KZ	2	2+0	Z	PV
11Y1LP	Linear Programming	KZ	2	2+0	L	PV
17Y1LL	Logistics of Passenger and Freight Air Transport Petra Skolilová Petra Skolilová (Gar.)	KZ	2	2P+0C	L	PV
11Y1MM	Mathematical Models in Economy	KZ	2	2P+0C	Z	PV
18Y1MT	Engineering Materials Jaroslav Valach	KZ	2	2P+0C	L	PV
17Y1ND	Maritime Transportation	KZ	2	2+0	Z	PV
14Y1NH	Databases Design and Programming	KZ	2	2+0	L	PV
14Y1NB	Databases Design and Programming	KZ	2	2+0	L	PV
14Y1NP	Non-parametric 3D Modelling	KZ	2	2+0	Z	PV
20Y1NS	Neural Networks	KZ	2	2+0	Z	PV
20Y1OI	Fare Collection and Information Systems Milan Sliacky, Patrik Horaž ovský Milan Sliacky (Gar.)	KZ	2	2P+0C	L	PV
14Y1OL	Linux Operating System	KZ	2	2+0	Z	PV
14Y10S	Operating Systems	KZ	2	2+0	Z	PV
15Y1OP	Turning Points of the Czech Nation	KZ	2	2+0	L	PV
11Y1PV	Parametrical and Multicriterial Programming Olga Vraštilová	KZ	2	2P+0C	Z	PV
13Y1PM	Personal Management	KZ	2	2+0	L	PV
12Y1PC	Pedestrian and Cycling Transport	KZ	2	2P+0C	L	PV
20Y1PO	Weather, Air Quality and Transportation	KZ	2	2+0	Z	PV
14Y1PG	Computer Graphics	KZ	2	2P+0C	L	PV
11Y1PE	Computer Controlled Experiments	KZ	2	2+0	L	PV
13Y1PD	The Participation of Transport in Tourist Trade Management	KZ	2	2+0	L	PV
14Y1PM	Advanced Methods of Parametric Programming	KZ	2	2+0	L	PV
21Y1PU	Aircraft Maintenance Technology	KZ	2	2+0	L	PV
12Y1PD	Assessment of Transport Structures	KZ	2	2P+0C	Z	PV
14Y1PJ	C Programming Language	KZ	2	2P+0C	Z	PV
12Y1C1	Designing Roads in Civil 3D I Tomáš Honc	KZ	2	2P+0C	L	PV
12Y1C2	Designing Roads in Civil 3D II Tomáš Honc	KZ	2	2P+0C	Z	PV
18Y1P1	Design of Structures 1	KZ	2	2+0	L	PV
16Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2	2P+0C	L	PV
12Y1PU	Organization Disposition of Railway Stations	KZ	2	2P+0C	L	PV
12Y1RZ	Railway Lines Reconstruction	KZ	2	2+0	Z	PV
16Y1RE	Control and Electronic Vehicle Systems Josef Mík, P emysl Toman	KZ	2	2P+0C	Z	PV
16Y1RV	Railroad Vehicles Driving	KZ	2	2+0	L	PV
21Y1RL	Air Traffic Control	KZ	2	2+0	L	PV
13Y1SM	MESE Simulation	KZ	2	2+0	Z	PV
20Y1SC	Sensors and Actuators	KZ	2	2P+0C	L	PV
11Y1SI	Transportation Software Engineering Martin P ni ka	KZ	2	2P+0C	Z	PV
12Y1SU	Road Management and Maintenance Dagmar Ko árková, Otakar Vacín	KZ	2	2P+0C	L	PV
18Y1SN	Statically Nondeterminated Structures	KZ	2	2+0	Z	PV
16Y1TJ	Technological Quality Aspects	KZ	2	2+0	Z	PV
20Y1TE	Technology of Electronic Systems	KZ	2	2+0	L	PV
20Y1TD	Telematics Databases	KZ	2	2+0	Z	PV
11Y1TG	Graph Theory Lucie Kárná Lucie Kárná (Gar.)	KZ	2	2P+0C	L	PV
16Y1TR	Theory of Railroad Vehicle Driving	KZ	2	2+0	Z	PV
16Y1TZ	Transporting Devices	KZ	2	2+0	L	PV

14Y1TI	Creating Interactive Internet Applications	KZ	2	2P+0C	L	PV
18Y1UK	Introduction of Rail Vehicles Jitka ezní ková, Josef Kolá	KZ	2	2P+0C	L	PV
14Y1VB	Visual Basic	KZ	2	2+0	L	PV
12Y1VC	Waterways and Shipping	KZ	2	2P+0C	Z	PV
14Y1VM	Development of Applications for Mobile Devices	KZ	2	2P+0C	Z	PV
21Y1ZT	ATM Systems	KZ	2	2+0	Z	PV
16Y1ZG	Introduction into Applied Computer Graphics	KZ	2	2P+0C	L	PV
18Y1ZD	Basics of Two-Dimensional Design	KZ	2	2+0	Z	PV
11Y1ZF	Introduction to Solid State Physics	KZ	2	2+0	Z	PV
14Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2	2P+0C	L	PV
18Y1ZT	Basics of Three-Dimensional Design	KZ	2	2+0	L	PV
12Y1ZU	Principles of Urbanism Karel Hájek	KZ	2	2P+0C	Z	PV
16Y1ZL	Vehicle Testing, Legislation and Construction Josef Mik. Zuzana Radová	KZ	2	2P+0C	Z	PV

17Y1AF Alternative Forms of Transportation Project Financing	11/12	
The could be a selfed and from a figure in the contest of the could be a shift of the first be for I delt.	KZ	2
There will be specifed such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from it	s budget, but the	e final debtor
is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alteri	native source of	transportation
project.		
18Y1AM Anatomy, Mobility and Safety of Man	KZ	2
Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation	and nervous syst	tem. Structur
and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured m	=	
joint prostheses. Protective means and traffic safety regulations.		
14Y1AV Animation and Visualization	KZ	2
Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Spa	ce Warp objects	s. Atmospheri
and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation us		
14Y1AP Automatization in Mail	KZ	2
Technology of post shipment submission, transport, and delivery via physic and electronic way, virtual post operation. Technology of information transmis		
application of new information and communication technologies in an offer of permanent, mobile, and NGN e-communication networks, solutions to e-communication networks, solutions to e-communication networks.	· ·	=
technological principles of end telecommunication devices.		
17Y1BB Banks and Banking	KZ	2
Banks and banking system. Balance sheet, income statement, bank's capital and its functions. Banking risks. Banking products. Interest types, pay-off an		
products. Banking deposit products. Banking payment-clearing products. Financial intermediation, open-end and closed-end funds, collective investment	-	
its role. Bank regulation and supervision. International banking.		
14Y1BE Barrierless Transport	KZ	2
The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students view.		_
of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems		
Theoretical knowledge will be supplemented by practical examples.		
15Y1BO Work Safety and Health Protection in Transportation	KZ	2
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. He	l l	
health insurance of home and foreign business trips, statistics, working practice.	uiui protociicii p	orogrammoo,
15Y1DU History of Art and Society	KZ	2
History of art - definitions, terminology, division into periods. Architecture, fine arts, design. Situation in Central Europe, today in the Czech Republic. Sta		
buildings. Design of transport vehicles.	lions, bridges, in	luusiilai
	1/7	
15Y1DZ History of Railway	KZ	2
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Repub		
War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections and projections.	ons, railway iines	s construction
railway accidents, railway junctions. Excursions and projections.		
17Y1DZ Transported Commodities Cognization	KZ	2
Useful features. Quality. Testing. Standardization. Features relevant for the transport. Packing. Stress. Protection of goods and damage prevention during	the carriage. Op	ptimization
of the choice and effective transport means utility.		
18Y1D1 Dynamics of Routes and Vehicles 1	KZ	2
Theory and analysis of vibration of multimass systems. Dynamical model of vehicle and interaction with transport structure. Assessment of structure vibration with transport structure.	ation and allowa	able criteria.
Vibroisolation and absorbers of dynamical effects. Methods of experimental dynamics. FEM in structure dynamics.		
13Y1EA Economic - Energetic Analysis of Land Transport	KZ	2
Vehicle traction systems, traction-energetic properties, laws of vehicle motion, assessment of energy demands, traction-energetic conceptions, technical, e	conomical and s	social aspect
10/45/4	KZ	2
13Y1EV Public Sector Economy		
13Y1EV Public Sector Economy Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities, externalities in		
Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities, externalities in	jects by the CBA	A method,
	jects by the CBA	A method,
Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities ir treatment, methods of assessment of public projects, transport projects and their funding, benefits of transport projects, the assessment of transport products and their funding, benefits of transport projects, the assessment of transport projects. HDM-4, CSHS.		
Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities in treatment, methods of assessment of public projects, transport projects and their funding, benefits of transport projects, the assessment of transport projects. 17Y1EV Public Sector Economy	KZ	2
Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities, externalities ir treatment, methods of assessment of public projects, transport projects and their funding, benefits of transport projects, the assessment of transport pro HDM-4, CSHS.	KZ ic projects (CBA	2 , MCA, CEA

15Y1EH 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, communism goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and		-
New quality of French-German relationship - a driving power of starting European integration.		
18Y1EV Experimental Methods and Numerical Modelling Physical properties measured in structural mechanics and dynamics. Principles of strain gauge measurement. Theory of photoelasticimetry, experimen	KZ	2
Basic principles of numerical methods in structural mechanics and dynamics. Finite element method in statics and dynamics. Geometry developmen		-
of structural elements. Boundary conditions. Material models. Solution of problems.		
15Y1FD 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 tr	KZ	2 erminology
French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastrono	•	cirilinology.
20Y1GI Geographical Information Systems	KZ	2
Introduction to geographical information systems, creating real-world model, data models, storage of geographical data, methods of data entry, digit systems, map projections, raster and vector representation, spatial algorithms and operations, and general transport roles in GIS.	ization, geographi	cal coordinate
14Y1GD GIS and Maps Digitalization	KZ	2
Work with map sources and their creating. Maps digitalization and creation. Use and creation of other (non-graphic) information with use of database	es. Interlinking ext	ernal references
with drawings containing maps. 14Y1HW Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate		l
arithmetic and logical units, I/O subsystem.	1/7	
15Y1HL History of Civil Aviation Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development	KZ of airports in the C	2 Czech Republic.
World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era	•	•
aviation. Modern era of civil aviation. Airline companies. Supersonic flying.	1/7	
15Y1HD History of City Mass Transport History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current tren	KZ nds and developme	2 ents of tariff and
clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and S		
12Y1HD Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regula area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area		
computing and measurement of transport noise. Acoustic studies, measuring protocol.		
15Y1HE Work Hygiene and Ergonomics in Traffic	KZ	2
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of thes Creation and protection of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology t		
Practical examples from the field of transportation; relevant legislature.	o possibilities and	Skills of a man.
20Y1IC Human Machine Interaction	KZ	2
Interaction of human-system. Methods and procedures for detecting decrease in attention. Used software and hardware tools. Bio-feedback, EEG material 16Y1KJ Railroad Vehicles	neasurements.	2
21st century mobility. Recent construction of railroad, city and intercity public vehicles, future and present situation, speed as a solution, maglev. From p	1	l
some realization in the world. Division and ways of drive, efficient electronics, changers, railroad traction, energetic calculation. Railroad safety signal	Illing systems, rail	road vehicle and
infrastructure compliance (interference). Testing. 12Y1KN Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping area	1	l
20Y1K Cybernetics	KZ	2
Fundamentals of information theory, dynamic systems, the principle of feedback, logical systems. Finite automata as a special case of dynamical system and automata.	ms. Relations bet	ween languages
21Y1LM Aviation Meteorology	KZ	2
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospherical fronts. Atmospherical precipitation, origin	& categorisa	tion. Turbulence.
Forces producing wind. Cyclone and anticyclone. Gradient wind. Geostrofical and geocyclostrophical wind. Visibilities in air transport. Dangerous meter maps. Climatology. Circulation. Intertropical front. Meteorological information.	orological aspects	s. Meteorological
21Y1LR Radio Technology in Aviation	KZ	2
Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic v	wave propagation.	Wave ranges
in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters. 21Y1L Airports - Design and Operation	KZ	2
21Y1L Airports - Design and Operation Introductory conditions for development of planning of runway systems and terminal facilities. Road construction, approximate analysis of RWY distar		l
activities. Certification of international airports - standard checking. Unexpected events and their handling.		
21Y1LC Human Factor	KZ	2
Human performace & Description amp; limitations, ability & Description accident statistics, flight safety, basics of flight physiology, individuals & Description amp; environ sensory system, health & Description amp; hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing,	=	•
& model of human error, biorhythms & sleep, stress, fatigue, working methods.		
11Y1LP Linear Programming	KZ	2
Definition of the optimization problem of linear programming, application of the linear programming on economic and technical problems, normal tra with constrains. Geometrical interpretation of linear programming problems, simplex method, duality principle.	ing broblettis and	uanic problems
17Y1LL Logistics of Passenger and Freight Air Transport	KZ	2
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial to air cargo. Information systems in air transport. Global distribution systems.	ransport process	passengers and
air cargo. Information systems in air transport. Global distribution systems. 11Y1MM Mathematical Models in Economy	KZ	2
The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their programming.		l
of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.		
18Y1MT Engineering Materials Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers	KZ and composites.	2 attention is paid
to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection		- Paid

17Y1ND Maritime Transportation	KZ	2
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and the maritime ports and the providing ports are applied to a positive ports.		-
maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transporta containers, ITS in maritime transport.	tion, maritime transpo	rtation and smart
14Y1NH Databases Design and Programming	KZ	2
Students in this course will deepen their knowledge and skills in database design and learn the procedural extension of SQL, PL/SQL, which may	1	1
on the level of the database engine.		
14Y1NB Databases Design and Programming	KZ	2
Every student will design his own application - that means design database, programme basic graphical interface and requested application be		_
14Y1NP Non-parametric 3D Modelling	KZ	2
Work in 3D non-parametricmodeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.	object data creation, v	work with data
20Y1NS Neural Networks	KZ	2
The basic structure and function of human brain and its main functional blocks and building elements - neurons. Models of neurons, modelling t	1	1
of artificial neural networks.		. 0
20Y10I 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	·	tables, maps,
panels) and operators (cycles, location or current delay of vehicles,). The issue of tariff systems. Other examples of clearance systems (pa		
14Y1OL Linux Operating System	KZ	2
Distributions. GNU/Linux system installation. X-window system. Rights - Users and Groups, ACL rights. Filesystems and file attributes. Programs Basic console commands. Configuration files. Managing SW system. Programs in graphic mode - tools for text, graphics, sound, video, communications.	•	,
of OS secure configuration. Remote administration.	ation. Oct vices manag	cincil. i incipies
14Y1OS Operating Systems	KZ	2
Operating systems, their function and architecture, process and memory management, virtual memory, threads, interprocess communication, syr		
of operating systems Win and Linux, start of PC and operating systems, networking, safety in OS, terminals in MS Win and Linux, batch files. D	omains and workgrou	ıps in MS Win,
users and their rights, configuration of networks, Windows registry, remote desktop.	1	_
15Y1OP Turning Points of the Czech Nation	KZ	_ 2
Crucial moments of more than a thousand-year long history of Western Slavs in Central Europe. Emphasis on relations to bordering nations an	•	
state. Lands of the Czech Crown as a part of Habsburgh monarchy. 19th century political programmes. Foundation of Czechoslovakia. Disputes Changes of power structure in Europe during 20th century and the position of the Czech nation.	over the sense of C2	ecii fiistory.
11Y1PV Parametrical and Multicriterial Programming	KZ	2
Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear consti	I	1
13Y1PM Personal Management	KZ	2
Basic overview of leadership issue from the viewpoint of an employee as well as a manager. The accent at the experience of basic situations the	rough a simulation ga	me. Systemic
approach to the personal management, the assessment as a process, SWOT analysis, basic principles of personal management, theory and pract	ce of motivation, mana	agerial leadership
styles. 12V1PC Pedestrian and Cycling Transport		2
12Y1PC Pedestrian and Cycling Transport	KZ	2 esign parameters
	cle route layout and de	esign parameters
12Y1PC Pedestrian and Cycling Transport Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cy for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossroads. Traffic signs and road marking for cyclists.	cle route layout and de	esign parameters
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12Y1PC Pedestrian and Cycling Transport	rcle route layout and do cossings with other tra	esign parameters nsport modes, 2 recast evaluation.
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12Y1PC	cle route layout and decossings with other transportation in climate KZ the editing programs (value KZ) asurement devices, see KZ asurement devices, see KZ applets, standard air care KZ the k	esign parameters nsport modes, 2 recast evaluation. e change. 2 election of 2 riers, low cost air 2 ution lines. 2
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18Y1P1			
	Design of Structures 1	KZ	2
Beam on elastic Winkler	ements, virtual work. Strength method. Frame analysis by strength method. Deformation method. Frame analysis by deformation. Calculation of beam on elastic foundation. Basics of the mathematical elasticity. Wall as a structural element. For Examples of calculations.		
16Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
•	uction. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measure	ment. Transmission	on mechanism.
General principles of en 12Y1PU	-	KZ	2
-	Organization Disposition of Railway Stations enger transport equipment. Branch lines and railway traffic inside industrial company areas. Zo	l l	
-	ology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway n		,
12Y1RZ	Railway Lines Reconstruction	KZ	2
•	inance technology.Track maintainance machinery, superstructure and substructure building machinery and special rail vehicles I elimination principles. Track sections and station tracks exclusion planning. Reconstruction timetable design of railway supe	-	- 1
16Y1RE	Control and Electronic Vehicle Systems	KZ	2
	regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disa		
and hybrid drive control. comfort systems.	Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control,	safety, communic	ation and
16Y1RV	Railroad Vehicles Driving	KZ	2
Electric circuits in railroa Searching and solving fa	d vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology.	Solution of emerg	ency situations.
21Y1RL	Air Traffic Control	KZ	2
	leir distribution. Organization of air traffic, flow and capacity management. Airspace management. System support for aircraft	1	
•	n of aircraft. Reports of air traffic services, form, content. Harmonization and integration of ATC. CFMU and its subsystems. F	lexible use of airs	pace - FUA.
RVSM, RNP. New trends 13Y1SM	In the area of ALC. MESE Simulation	KZ	2
	ivition of simulation Ilating corporate decision making. Groups of students produce the same product, give the volume of available production cap		
research and developme		<i>,,</i> ,	37
20Y1SC	Sensors and Actuators	KZ	2
•	actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensor dity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.	s of mechanical, e	lectro-magnetic,
11Y1SI	Transportation Software Engineering	KZ	2
	re engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and impler	1	_
and practical usuage.			_
12Y1SU	Road Management and Maintenance ership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented develop	KZ	2
-	trategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and rej		
classroom as well as inv	estment activity in highway engineering.		
18Y1SN	Statically Nondeterminated Structures	KZ	2
	m element, virtual work. Strength method. Frame analysis by strength method. Deformation method. Frame analysis by defornkler's foundation. Calculation beam on elastic foundation. Basement of the mathematical elasticity. Calculation of walls. Cal	rmation method. S	simpie pianar – į
shells. Examples of calc	·	culation of plates.	Cylindrical
	liations.	culation of plates.	Cylindrical
16Y1TJ	Technological Quality Aspects	culation of plates.	Cylindrical 2
Certification and acredita	Technological Quality Aspects tion. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of	KZ	2
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12Y1VC Waterways and Shipping	KZ	2
Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. A	dvantages and disadvantages of water transpor	t. Basic systems
of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipmer		•
in inland navigation, navigation rules of operation, navigation maps.		0 0
14Y1VM Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, dev	velopment application - widgets, containers, thre	ads, menu,
permissions, services, GUI.		
21Y1ZT ATM Systems	KZ	2
The course introduces classical and modern facilities, systems and technologies designed for ATS. Student obtains kn	nowledge of technical principles and solutions of	communication,
navigation and surveillance systems used in aviation.	147	
16Y1ZG Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colou		
and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graph	ics and visualisation HW basics. Introduction to	2D and 3D
graphics software.		
18Y1ZD Basics of Two-Dimensional Design	KZ	2
The comprehensive teaching method includes primary creative principles and the introduction to the logic of free shape relatioships to more complex ones. The topics are closed by two-dimensional variations on basic conceptual elements		sing from simple
11Y1ZF Introduction to Solid State Physics	KZ	2
Structure of solids, crystal lattice, Bloch function, Brillouin zones. Bend theory of solids. Dynamics of 1D lattice. Phono	ons. Thermodynamic properties of solids. Semico	onductors.
Magnetism.		
14Y1ZM 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. In	nport and export
from and to another systems. Fundamentals of assemblies creation.		
18Y1ZT Basics of Three-Dimensional Design	KZ	2
The design tasks focus first on the three-dimensional design in defined space. The next step is the synthesis of the int	ernal space with three-dimensional elements an	d correct shape
modelling.		
12Y1ZU Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, re	creation, transportation). Spacial arrangement o	f settlements.
Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use plann	ing.	
16Y1ZL Vehicle Testing, Legislation and Construction	KZ	2
Vehicle, bus and motorbike costruction, aggregate computing, driving resistance, build and parameters of traction, constr	uctional arrangement of personal cars, trucks, bu	ses, motorbikes,
legislation in the EU and in the world, technical legislation creation, testing methods, vehicle tests, accelerated tests, r	nathematical modelling in testing.	

Name of the block: Jazyky

Minimal number of credits of the block: 12

The role of the block: J

Code of the group: JZ-B-3.4 12/13

Name of the group: Jazyk bak. 5.6.sem. od 12/13

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:

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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
15JZ3A	Foreign Language - English 3 Eva Rezlerová, Jan Feit, Markéta Musilová, Lenka Monková, Marie Michlová, Peter Morpuss, Jitka He manová, Dana Boušová, Barbora Horá ková,	Z	3	0P+4C	Z	J
15JZ4A	Foreign Language - English 4 Eva Rezlerová, Jan Feit, Markéta Musilová, Lenka Monková, Marie Michlová, Peter Morpuss, Jitka He manová, Barbora Horá ková, Markéta Vojanová	Z,ZK	3	0P+4C	L	J
15JZ3F	Foreign Language - French 3 Eva Rezlerová, Irena Veselková	Z	3	0P+4C+10E	3 Z	J
15JZ4F	Foreign Language - French 4 Eva Rezlerová, Irena Veselková	Z,ZK	3	0P+4C+10E	L L	J
15JZ3N	Foreign Language - German 3 Eva Rezlerová, Martina Navrátilová, Jana Štikarová	Z	3	0P+4C+10E	3 Z	J
15JZ4N	Foreign Language - German 4 Eva Rezlerová, Martina Navrátilová, Jana Štikarová	Z,ZK	3	0P+4C+10E	L L	J
15JZ3R	Foreign Language - Russian 3 Eva Rezlerová, Marie Michlová	Z	3	0P+4C+10E	3 Z	J
15JZ4R	Foreign Language - Russian 4 Eva Rezlerová, Marie Michlová	Z,ZK	3	0P+4C+10E	B L	J
15JZ3S	Foreign Language - Spanish 3 Eva Rezlerová, Nina Hricsina Puškinová	Z	3	0P+4C+10E	Z	J
15JZ4S	Foreign Language - Spanish 4 Eva Rezlerová, Nina Hricsina Puškinová	Z,ZK	3	0P+4C+10E	L L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-B-3.4 12/13 Name=Jazyk bak. 5.6.sem. od 12/13

15.IZ3A Foreign Language - English 3 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study pilot. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written form. Technical texts and their features; terminology. Foreign Language - English 4 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study - pilot. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written form. Technical texts and their features; terminology 15JZ3F Foreign Language - French 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. 15JZ4F Foreign Language - French 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 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. 15JZ3N Foreign Language - German 3 Ζ 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 Foreign Language - German 4 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. 15JZ3R Foreign Language - Russian 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. Z.ZK

Foreign Language - Russian 4 15JZ4R

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.

15JZ3S Foreign Language - Spanish 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.

Foreign Language - Spanish 4

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.

Code of the group: JZ-B-1,2 11/12

Name of the group: Jazyk bak.3.4.sem.od 11/12

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 OIL THE	<u> </u>					
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
15JZ1A	Foreign Language - English 1 Eva Rezlerová, Jan Feit, Markéta Musilová, Lenka Monková, Marie Michlová, Peter Morpuss, Jitka He manová, Dana Boušová, Barbora Horá ková,	Z	3	0P+4C+10E	Z	J
15JZ2A	Foreign Language - English 2 Eva Rezlerová, Jan Feit, Markéta Musilová, Lenka Monková, Marie Michlová, Peter Morpuss, Jitka He manová, Dana Boušová, Barbora Horá ková,	Z,ZK	3	0P+4C+10E		J
15JZ1F	Foreign Language - French 1	Z	3	0+4	Z	J
15JZ2F	Foreign Language - French 2	Z,ZK	3	0+4	L	J
15JZ1N	Foreign Language - German 1	Z	3	0+4	Z	J
15JZ2N	Foreign Language - German 2	Z,ZK	3	0+4	L	J
15JZ1R	Foreign Language - Russian 1	Z	3	0+4	Z	J
15JZ2R	Foreign Language - Russian 2	Z,ZK	3	0+4	L	J
15JZ1S	Foreign Language - Spanish 1	Z	3	0+4	Z	J
15JZ2S	Foreign Language - Spanish 2	Z,ZK	3	0+4	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-B-1,2 11/12 Name=Jazyk bak.3.4.sem.od 11/12

15JZ1A	Foreign Language - English 1	Z	3
Grammatical Structo	ures and Style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive	and communicative :	skills. Elementa
stylistics forms. Ora	l and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.		
15JZ2A	Foreign Language - English 2	Z,ZK	3
Grammatical structu	ures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive	and communicative s	skills. Elementa
stylistics forms. Ora	l and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.		
15JZ1F	Foreign Language - French 1	Z	3
3rammar structure	and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Fa	aculty's fields of stud	y. Focus on
mprovement in per	ceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both	n oral and written form	ns. Technical
exts and their featu	res; practice of oral and written presentation.		
15JZ2F	Foreign Language - French 2	Z,ZK	3
3rammar structure	and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Fa	aculty's fields of stud	y. Focus on
	ceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both	n oral and written form	ns. Technical
exts and their featu	res; practice of oral and written presentation.		
15JZ1N	Foreign Language - German 1	Z	3
3rammar structure	and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Fa	aculty's fields of stud	y. Focus on
mprovement in per	ceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both	oral and written form	ns Technical
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	tres; practice of oral and written presentation.		
		Z,ZK	3
15JZ2N Grammar structure	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Fa	Z,ZK aculty's fields of stud	3 y. Focus on
15JZ2N Grammar structure mprovement in pero	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both	Z,ZK aculty's fields of stud	3 y. Focus on
15JZ2N Grammar structure mprovement in pero exts and their featu	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in bothers; practice of oral and written presentation.	Z,ZK aculty's fields of stud n oral and written form	3 y. Focus on
15JZ2N Grammar structure mprovement in pero exts and their featu 15JZ1R	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both tres; practice of oral and written presentation. Foreign Language - Russian 1	Z,ZK aculty's fields of stud n oral and written forn	3 y. Focus on ns. Technical
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15JZ2N Grammar structure mprovement in perc exts and their featu 15JZ1R Grammar structure mprovement in perc	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both tree; practice of oral and written presentation. Foreign Language - Russian 1 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and stylistics.	Z,ZK aculty's fields of stud n oral and written forn Z aculty's fields of stud n oral and written forn	3 y. Focus on ns. Technical 3 y. Focus on ns. Technical
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15JZ2N Grammar structure mprovement in percents and their feature 15JZ2S	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both tres; practice of oral and written presentation. Foreign Language - Russian 1 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both tres; practice of oral and written presentation. Foreign Language - Russian 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both tres; practice of oral and written presentation. Foreign Language - Spanish 1 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both tres; practice of oral and written presentation. Foreign Language - Spanish 2 Foreign Language - Spanish 2	Z,ZK aculty's fields of study n oral and written form Z aculty's fields of study n oral and written form Z,ZK aculty's fields of study n oral and written form Z aculty's fields of study n oral and written form Z aculty's fields of study n oral and written form	3 y. Focus on ns. Technical
15JZ2N Grammar structure mprovement in percents and their feature mprovement in percent mprovement in percents and their feature mprovement in percent mprovement in percents and their feature mprovement in percent mprovement in percents and their feature mprovement in percents and t	Foreign Language - German 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in bothers; practice of oral and written presentation. Foreign Language - Russian 1 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in bothers; practice of oral and written presentation. Foreign Language - Russian 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in bothers; practice of oral and written presentation. Foreign Language - Spanish 1 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in bothers; practice of oral and written presentation. Foreign Language - Spanish 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in bothers; practice of oral and written presentation. Foreign Language - Spanish 2 and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faceptive and communicative skills; widening the vocabulary. Basic kinds of compositions.	Z,ZK aculty's fields of study or oral and written form Z aculty's fields of study or oral and written form Z,ZK aculty's fields of study or oral and written form Z aculty's fields of study or oral and written form Z aculty's fields of study oral and written form Z,ZK aculty's fields of study oral and written form	3 y. Focus on ns. Technical 3 y. Focus on ns. Technical
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List of courses of this pass:

Code	Name of the course	Completion	Credits
00TVC1	Physical Education 1	Z	1
Practical instruction	n and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic.	basketball, volleyb	all, soccer,
00TVC2	Physical Education 2	Z	1
Practical instruction	n and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic.	basketball, volleyb	all, soccer,
11DAD	Differential and Difference Equations	Z,ZK	3
•	s and its systems. Some solvable types of differential equations of the first order. Linear differential equations of the n-th order. Methods for inhomogeneous equation by means of variation of constants. Power series and their use for solution of differential equation. Boundary and function for differential equation. Fourier series of function.		-
11FY1	Physics 1	Z,ZK	4
Kinen	natics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directe	d electric current.	ı
11FY2	Physics 2	Z,ZK	4
Magnetic field, elec	tromagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-electr solid body physics.	on atoms, the nucle	ei. Basics of
11GIE	Geometry	KZ	3
Differential geome	try of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory c acceleration of a particle moving on a curved path.	of the motion, the ve	elocity, and
11LA	Linear Algebra	Z,ZK	3
Vector spaces (line	ar combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and the their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classificat	•	minants and
11MDS	Collection and Processing of Traffic Data	KZ	2
Basic princ	siples of traffic detection and data collection, specific problems of the field of traffic data. Data preprocessing and analysis for use in a	additional application	ns.

44MCD	Madeline of Cystoms and Drassess	7 71/	1
11MSP	Modeling of Systems and Processes stem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differe	Z,ZK	4
	linear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function		
	Discretization of continuous systems. System interconnection.	,	,
11MTA	Mathematical Analysis	Z,ZK	4
Sequences and se	ries of real numbers and its convergence. Basic properties of functions. Differential and integral calculus of the real function of one real	variable. Power se	ries, Fourier
	series and foundations of Fourier transform.		
11MVP	Mathematical Analysis of Function of More Variables	Z,ZK	3
	uences in metric spaces, limit of sequence in metric space. Differential calculus of functions of several variables, differential of function extremes of functions of several variables. Integral calculus of functions of several variables, Riemann integral, integral over curves ar	•	
delinea fariotions,	of integral calculus in physics.	ia sariaces iii ito,	application
11PT	Probability	Z	2
	cs. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability	distribution, prob	ability mass
and density, mom	ents, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. M	lixed distributions,	mixture of
	distributions. Law of large numbers, central limit theorem.		
11SIS	Statistics Statistics	Z,ZK	2
-	properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and cent, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression,		- 1
11X31	Project 1	Z	2
11X32	Project 2	Z	2
11X33	Project 3	<u>z</u>	2
11Y1LP	Linear Programming	KZ	2
	timization problem of linear programming, application of the linear programming on economic and technical problems, normal traffic p		
•	with constrains. Geometrical interpretation of linear programming problems, simplex method, duality principle.		·
11Y1MM	Mathematical Models in Economy	KZ	2
The goal of the co	urse is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program		The outcom
44)/455	of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained opt		
11Y1PE	Computer Controlled Experiments of experiment consisting of designing, measurement method selection according to required results accuracy and available measure	KZ	2
impiementation	computer-recorded parameters, data acquisition and results calculation. Evaluation of measurement method accuracy and result un		ection of
11Y1PV	Parametrical and Multicriterial Programming	KZ	2
	olem of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear constraints. Co		'
11Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of s	software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implement	tation using forma	l techniques
	and practical usuage.		
11Y1TG	Graph Theory	KZ	2
	d terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, min rian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence ar		
pa p. 02.0, _a.o	for their solving. Computational complexity, dealing with NP-complete problems, heuristic approach.	ia optiiii.	a aigeilainie
11Y1ZF	Introduction to Solid State Physics	KZ	2
Structure of soli	ids, crystal lattice, Bloch function, Brillouin zones. Bend theory of solids. Dynamics of 1D lattice. Phonons. Thermodynamic properties	of solids. Semicor	nductors.
	Magnetism.		
12MDE	Transport Models and Transport Excesses	Z,ZK	3
	traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of quassessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the conseque	*	, ,
transport and its t	safety and fluency.	mocs. Improving c	n transport
12PKD	Rail Transport Designing	Z,ZK	3
	ork. Vehicle and track relation. Traction. Track geometrical parameters. Clearance profile. Railway lines routing. Superstructure and sul	•	' '
	Switches. Railway stations. City rail transport.		_
12PPOK	Designing Roads, Highways and Motorways	KZ	3
	ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety	•	
Kange of vision for	intersections.	device. Crossing	is, juricuoris,
12X31	Project 1	Z	2
12X32	Project 2	 Z	2
12X33	Project 3	Z	2
12Y1C1	Designing Roads in Civil 3D I	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		sign 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	course also includ	les a basic
	explanation of the traffic building design in the real-life profession.		
12Y1C2	Designing Roads in Civil 3D II	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 uilding, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The p	-	- 1
partioular illical D	improved and developed. Students learn to design intersections.	acquire	S Omilio al C
12Y1HD	Traffic Noise	KZ	2
	on, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulations		1
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46374173	computing and measurement of transport noise. Acoustic studies, measuring protocol.		
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Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database	<u>-</u>			_
	Basic concepts			aatabase

14DM	Datamining	KZ	2
	Datamining		
Types of data source	es and acquired knowledge, data stores and OLAP technology for knowledge acquiring from data, data preprocessing at knowledge	acquiring process,	datamining
systems, classes	characteristics mining, mining of asocial rules from data stores and databases, classification (decision-making tree, Bayes classificat	ion, use of neuron	networks).
	Prediction. Cluster analysis. Mining in complex structured data, multimedial dbf, www.		
14ELN	Electronics	Z,ZK	3
	iodes and thyristor and their applications. Transistors, their basic connecting and applications. Operational amplifiers, their linear and		_
00111001100001	frequency characteristics. Passive and active frequency filters. AD and DA converters.	miodi appiiod	
441500		1/7	
14IFSD	Information Systems in Transportation	KZ	2
•	ands, IS types for transport area, common IS structures. Continuous and discrete simulation. Visualization, coding and encryption, se	•	I
channel. Optimizin	g by help of GA. Theory of games, Paret selections. IS's life cycle. Legal frame of IS at transportation. Governement IS. Development	of secure and rele	evant ISs at
	transportation. Real time operating IS. IS certification and validation.		
14ISYS	Information Systems	KZ	2
	ols of objects control (control and planning) including problems related to these toole use, theory of information and knowledge, know		
otate of the art to		louge and expert e	ystems, io
	planning methodologies, transaction systems, theory of computer networks, semantic webs and sensitivity analysis.		
14KSP	Constructing with Computer Aid	KZ	2
"CAD systems" ter	m determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common wor	k rules in graphic a	applications
and CA systems.	Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possib	ilites, AutoCAD en	vironment
	profiles, drawings with raster foundaments).		
14OJM	Object Oriented Modelling	Z.ZK	3
	object oriented SW development, fundamentals of object oriented approach. Explanation of basic classes, polymorphism, inheriting,	,	-
runuarnnetals in Ul	ML. Principles and processing use case diagrams, sequention diagrams, classes and states diagrams. Use of CASE tools for complex	anaiysis. Usability	oi Oivi and
	process modelling.		
14OS1	Operating Systems 1	KZ	2
OS, their function a	nd architecture, process and memory management, virtual memory, threads, interprocess communication, synchronizzation, file system	ns, architecture of C	OS Windows
	and Linux, start of PC and OS, networking, safety in S, terminals in MS Win and Linux, batch files.		
14OS2	Operating Systems 2	KZ	2
	, ,		
Domains and w	orkgroups in MS Windows, users and their rights, configuration of networks (NFS, Samba, Firewall, FTP, http, DHCP, DNS), Windows	register, remote d	езкиор,
	configuration files, programming - networking, threads.		
14RVD	Robotics in Transportation	Z,ZK	3
Understanding th	e following topics: robot and industrial manupulator, classification, mobile robot. Robot kinematics, co-ordinate systems. Special robo	ot sensors. Action r	nembers,
	le recognition, woring head. Industrial robots' control systems. Spatial orientation. Visual information processing. Mobile robots. Partic		I
tranomicolorior ract	systems. Artificial intelligence in robotics. Reactive systems.		0201000.
4.40010		1/7	
14SBIS	Information Systems Security Standards	KZ	2
Security, reliability	accessibility and servicebility of information systems. Physical versus information security, open versus closed system. Basic princip	les of security and	threats for
	information systems. Security of information systems - standards, development of standards, application of standards.		
14SE	High Voltage Electrical Engineering	KZ	2
Three-phase syste	em, single- and three-phase transformer, automatic transformer, electromagnet (solenoid), direct current generator and overview of ty	pes, direct current	motor and
	alternate current motors, rotary magnetic field of three-phase winding, synchronous and asynchronous (induction) motor, alternate of	-	
• • • • • • • • • • • • • • • • • • • •			
14SIAP	Networks and Protocols	KZ	2
	tion model, history and development of the Internet, principle of data transfer through computer networks (TCP/IP), performance of b	•	
RARP, TCP, UDP, T	elnet, FTP, DNS, DHCP POP3, IMAP), data acquirement from the Internet sources, communicating ability via the Internet and fundame	entals of own web p	resentation
	design by the means of web sites.		
14TC	Telecommunications	Z,ZK	3
	present stage and new trends in telecommunications systems. Legal conditions for telecommunications services provisioning and approximation of the communications are conditions.		
	s key elements applied in hierarchical architecture are introduces and relations between networks elements parameters and performance o	-	
relecommunication		i trie wrible telecorri	munications
	systems are explained in context with their typical applications in the transportations systems.		
14TLSY	Telecommunication Systems	Z,ZK	4
Characteristics of r	netallic and fiber lines, network passive and active elements. Physical layer design tools. Terrestrial and wireless (fixed and mobile) s	ystems - network a	rchitecture.
Most frequently us	ed protocols, their properties and mutual relations. Protocols application in e-communications systems for data and voice services an	d support of the IT	S systems.
14TSJ	Communication Technologies	Z	2
	· ·		
	ost shipment submission, transport, and delivery in physical and electronic way, virtual post operation. Technology of information trans-		- 1
application of new i	nformation and communication technologies in an offer of permanent, mobile, and NGN e-communication networks, solution to e-com	munication network	k interfaces,
	technological principles of end telecommunication devices.		
14UATT	Introduction to Automatization and Telecommunication Systems	KZ	2
	echnical cybernetics, automatization in transportation, human as the weakest element, signalling in transpotation, modelling and pro	jecting of transport	systems,
	gical and infromation system in post, principle of telecommunication signal transmission, solving of telecommunication networks, mo		-
<u> </u>	networks and services, NGN networks.	3	
1411000	· · · · · · · · · · · · · · · · · · ·	1/7	
14UPRO	Introduction to Programming	KZ	2
Algorithm develo	oment, methods of structured programming, high-level programming languages, basics of C programming languages (types, variable	s, conditions, cycle	es, arrays,
14VZ	functions), programming techniques, complexity.		4
	functions), programming techniques, complexity. 3D Vizualization	Z,ZK	
Description and p	3D Vizualization		
	3D Vizualization inciples of 3D modelling. Basic 3D primitiva and basic modification and transformation functions. SW tools for 3D visualization. Creat	ion of 3D scene. M	lodification
	3D Vizualization inciples of 3D modelling. Basic 3D primitiva and basic modification and transformation functions. SW tools for 3D visualization. Creat f 3D primitiva. Decsription of planes and work with them. Use of material editors and work with textures. Illumination of 3D scenes, so	ion of 3D scene. M	lodification
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14Y1AV	Animation and Visualization	KZ	2
	ng of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Spac s, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation u		
14Y1BE	Barrierless Transport	KZ	2
l .	ublic transportation in terms of architectural barriers and also for transportation-technological point of view. Students wi	l l	
of barrierless environment roads, rail	way stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems at	nd transportation t	technology.
	Theoretical knowledge will be supplemented by practical examples.		
14Y1GD	GIS and Maps Digitalization	KZ	2
Work with map sources and their cre	eating. Maps digitalization and creation. Use and creation of other (non-graphic) information with use of databases. Int	erlinking external	references
14Y1HW	with drawings containing maps. Computer Hardware	KZ	2
l .	ogical circuits design and their realization using FPGA. In detail, description of computer architecture and separate pa		
Comparer areameters, Sacres or re	arithmetic and logical units, I/O subsystem.	to doolgg	
14Y1NB	Databases Design and Programming	KZ	2
Every student will de	sign his own application - that means design database, programme basic graphical interface and requested application	on behaviour.	
14Y1NH	Databases Design and Programming	KZ	2
Students in this course will deepen the	heir knowledge and skills in database design and learn the procedural extension of SQL, PL/SQL, which makes it pos	sible to ensure da	ata integrity
	on the level of the database engine.		
14Y1NP	Non-parametric 3D Modelling	KZ	2
-	er (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object da nnected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.	ita creation, work	with data
14Y1OL	Linux Operating System	KZ	2
	tallation. X-window system. Rights - Users and Groups, ACL rights. Filesystems and file attributes. Programs and proce		
	tion files. Managing SW system. Programs in graphic mode - tools for text, graphics, sound, video, communication. Servi		
Ū	of OS secure configuration. Remote administration.	· ·	
14Y1OS	Operating Systems	KZ	2
	d architecture, process and memory management, virtual memory, threads, interprocess communication, synchronizati	-	
of operating systems Win and Linux	x, start of PC and operating systems, networking, safety in OS, terminals in MS Win and Linux, batch files. Domains a	and workgroups in	MS Win,
	users and their rights, configuration of networks, Windows registry, remote desktop.		
14Y1PG	Computer Graphics	KZ	2
	bilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing sing layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics		i the user
14Y1PJ	C Programming Language	KZ	2
l I	ssor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocation, string	l l	
	ns of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise opre		
14Y1PM	Advanced Methods of Parametric Programming	KZ	2
Assemblies programming - tools a	and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelin	nes, and distribution	on lines.
<u> </u>	Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.		
14Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language Ph	HP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your of	own application pr	ogrammed
14Y1VB	in PHP language.	KZ	2
	Visual Basic		2 estallation
	es for these applications. Work with VBA at superstructures creation for MS-Windows applications supporting VBA.	thor, or oation or in	lotaliation
14Y1VM	Development of Applications for Mobile Devices	KZ	2
· · · · · · · · · · · · · · · · · · ·	$_{\prime}$ a programming language, development environment, operating system Android, development application - widgets, c	ontainers, threads	s, menu,
	permissions, services, GUI.		
14Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2
Basics of work at products and parts	s creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D	sketches. Import	and export
447057	from and to another systems. Fundamentals of assemblies creation.		
14ZAET	Fundamentals of Electrotechnics	KZ	2
·	uantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assignating of bipoles a help of circuit analysis elementar methods: method of consecutive reduction, unloaded voltage divider, current divider.		
22.3 to alloot ourrorn officials With	and principle of superposition in direct current circuits.	garadon sta	piarigor
14ZINF	Fundamentals of Informatics	KZ	2
	-Word and Open Office, use of styles and advanced features, computer functions and information transmission. Number		
calculations. Algorithms and their pro	oprieties. Flow charts for algorithms drawing. Mathematic and logic ordering algorithms incl. functions and procedures.	Work with MS-Exc	cel - tables,
	graphs, calculations, functions.		
15JZ1A	Foreign Language - English 1	Z	3
	election of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and com		elementary
15JZ1F	Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of	rnetoric.	3
	Foreign Language - French 1 Conversational and specialised topics selected according to the language group level and with regard to the Faculty's	_	-
<u> </u>	mmunicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral ar		
, , , , , , , , , , , , , , , , , , , ,	texts and their features; practice of oral and written presentation.		
15JZ1N	Foreign Language - German 1	Z	3
· '	Conversational and specialised topics selected according to the language group level and with regard to the Faculty's	s fields of study. F	ocus on
improvement in perceptive and cor	mmunicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral ar	nd written forms. T	Technical
	texts and their features; practice of oral and written presentation.		

15JZ1R	Foreign Language - Russian 1	Z] 3
	cture and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty´ I perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral a	-	
improvement ii	texts and their features; practice of oral and written presentation.	na willen loinis	. recillical
15JZ1S	Foreign Language - Spanish 1	Z	3
	cture and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty	-	
	perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral a	-	
	texts and their features; practice of oral and written presentation.		
15JZ2A	Foreign Language - English 2	Z,ZK	3
Grammatical stru	ctures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and com	municative skills	. Elementa
	stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of	rhetoric.	
15JZ2F	Foreign Language - French 2	Z,ZK	3
	cture and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty'	-	
improvement in	perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral a	nd written forms	. Technical
45 17011	texts and their features; practice of oral and written presentation.	7.71/	
15JZ2N	Foreign Language - German 2 cture and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty´	Z,ZK	3
	perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral a	-	
improvement ii	texts and their features; practice of oral and written presentation.	na willen loinis	. recillical
15JZ2R	Foreign Language - Russian 2	Z,ZK	3
	cture and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty	•	_
	perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral a	-	
	texts and their features; practice of oral and written presentation.		
15JZ2S	Foreign Language - Spanish 2	Z,ZK	3
	cture and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty'	•	
improvement in	perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral a	nd written forms	. Technical
	texts and their features; practice of oral and written presentation.		
15JZ3A	Foreign Language - English 3	Z	3
	are and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fi		
nprovement in p	erceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and	written form. Ie	chnical tex
45 1705	and their features; terminology.	7	
15JZ3F	Foreign Language - French 3 ylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of lar	Z	3
	yilstics. Selection of conversation and professional topics based on the language level and study locus at the Faculty. Improvement of lan	iguage siructure	Kilowieug
and nercentive a	and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work wi		text and it
and perceptive a	and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work wi features. Practice of oral and written presentation.		text and it
	features. Practice of oral and written presentation.	ith (professional)	
15JZ3N	features. Practice of oral and written presentation. Foreign Language - German 3	ith (professional)	3
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15Y1BO			
	Work Safety and Health Protection in Transportation	KZ	2
Fundamental legisl	tive, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. He health insurance of home and foreign business trips, statistics, working practice.	ealth protection p	rogrammes,
15Y1DU	History of Art and Society	KZ	2
	finitions, terminology, division into periods. Architecture, fine arts, design. Situation in Central Europe, today in the Czech Republic. S		1
	buildings. Design of transport vehicles.		_
15Y1DZ	History of Railway	KZ	2
	nys, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Repu By development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connectic		
vvai ii iaiiways, iaiiw	railway accidents, railway junctions. Excursions and projections.	nis, ialiway ililes	construction,
15Y1EH	European Integration within Historical Context	KZ	2
	ormation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Lit	tle Entente, its p	rinciples and
goals. Europe afte	Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its	s consequences	for Europe.
45)(450	New quality of French-German relationship - a driving power of starting European integration.	1/7	
15Y1FD	French Area Studies and Transportation y and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traff	KZ	2
	ry and regions, transport finastructure. Pans and its signis, city public transport. Road traine, motorways, railway traine, 130, all trails society and culture. Current political system. System of education, studying in France. Selected authors of French literature. Frenc	•	irriiriology.
15Y1HD	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 trends a	nd development	s of tariff and
	ce systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Repub		
15Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
_	if occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these fa ion of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology to po		
Creation and protec	Practical examples from the field of transportation; relevant legislature.	ssibilities ariu sk	ilis oi a man.
15Y1HL	History of Civil Aviation	KZ	2
	development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of air	rports in the Cze	ch Republic.
World airports. Fa	nous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of	aviation. Golden	era of civil
45)(405	aviation. Modern era of civil aviation. Airline companies. Supersonic flying.		
15Y1OP	Turning Points of the Czech Nation i more than a thousand-year long history of Western Slavs in Central Europe. Emphasis on relations to bordering nations and Europ	KZ	2 Dromyolid
	e Czech Crown as a part of Habsburgh monarchy. 19th century political programmes. Foundation of Czechoslovakia. Disputes over t		-
	Changes of power structure in Europe during 20th century and the position of the Czech nation.		
16UDDM	Introduction to Transportation and Manipulation Technics	ZK	2
Means of transporta	ion and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water	er transportation.	Manipulating
	technics. Principles of lifting machines and conveyors. Legislature.		
16X31	Project 1	Z	2
16X32	Project 2	Z	2
16X33	Project 3	Z KZ	2
16Y1KJ	Railroad Vehicles Recent construction of railroad, city and intercity public vehicles, future and present situation, speed as a solution, maglev. From princip		_
	ne world. Division and ways of drive, efficient electronics, changers, railroad traction, energetic calculation. Railroad safety signalling	ole to design and	
		-	
16Y1PV	infrastructure compliance (interference). Testing.	-	
	Operation, Construction and Maintenance of Vehicles	systems, railroa	d vehicle and
Methods of vehicle	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measurements.	systems, railroa	d vehicle and
	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics.	systems, railroa KZ nt. Transmission	2 mechanism.
16Y1RE	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems	systems, railroa KZ nt. Transmission	2 mechanism.
16Y1RE Elementary concept	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics.	KZ nt. Transmission KZ ntages, function.	2 mechanism.
16Y1RE Elementary concept	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages.	KZ nt. Transmission KZ ntages, function.	2 mechanism.
16Y1RE Elementary concept	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvar control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, see the control of the contro	KZ nt. Transmission KZ ntages, function.	2 mechanism.
16Y1RE Elementary concept and hybrid drive	Operation, Construction and Maintenance of Vehicles oroduction. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvar control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, comfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solutions and servicing and operation of the railroad vehicles.	KZ nt. Transmission KZ ntages, function. safety, communic	2 mechanism. 2 Conventional cation and
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra	Operation, Construction and Maintenance of Vehicles oroduction. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems s of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, scomfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solutions and solving faults.	KZ nt. Transmission KZ ntages, function. safety, communic	2 mechanism. 2 Conventional cation and 2 cy situations.
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra	Operation, Construction and Maintenance of Vehicles oroduction. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems s of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, seconfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solution Searching and solving faults. Technological Quality Aspects	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen	2 mechanism. 2 Conventional cation and 2 cy situations.
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems s of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, seconfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solution Searching and solving faults. Technological Quality Aspects additation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of Quality Management.	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ ality improvemen	2 mechanism. 2 Conventional cation and 2 cy situations.
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems sof regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, so comfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solu Searching and solving faults. Technological Quality Aspects editation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of quality verification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and products and products.	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ ality improvemen	2 mechanism. 2 Conventional cation and 2 cy situations.
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16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr 16Y1TR Legislation in railro 16Y1TZ Flow of masses, matranspor	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, scomfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solu Searching and solving faults. Technological Quality Aspects editation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of querification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and products are products and products and products and products are products and products and products and products and products are product	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ allity improvemenucers. KZ raffic safety. Sign	d vehicle and 2 mechanism. 2 Conventional cation and 2 cy situations. 2 nt. Conformity 2 al systems. 2 al - continual t.
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr 16Y1TR Legislation in railro 16Y1TZ Flow of masses, matranspor 16Y1ZG	Operation, Construction and Maintenance of Vehicles oroduction. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems s of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvar control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, so comfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solu Searching and solving faults. Technological Quality Aspects editation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of querification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and product and transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad transport technology, loose material transport - conveyors with tractive elements, conveyors without tractive elements, transport devices, cyclic transport devices, crane mechanisms, steel constructions. Vertical transport, transport in mines, long-distance conve	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ allity improvemenucers. KZ raffic safety. Sign KZ t of piece materi	2 Conventional cation and 2 cy situations. 2 cy situations. 2 cy situations. 2 call conformity 2 call continual t. 2
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr 16Y1TR Legislation in railro 16Y1TZ Flow of masses, matranspor 16Y1ZG Computer graphics	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, scomfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solu Searching and solving faults. Technological Quality Aspects editation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of querification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and products are products and products and products and products are products and products and products and products and products are product	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ nality improvemenucers. KZ raffic safety. Sign KZ t of piece materi eyor belt transpor KZ nes, models, prin	d vehicle and 2 mechanism. 2 Conventional cation and 2 cy situations. 2 at. Conformity 2 al systems. 2 al - continual t. 2 nciples of 2D
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr 16Y1TR Legislation in railro 16Y1TZ Flow of masses, matranspor 16Y1ZG Computer graphics	Operation, Construction and Maintenance of Vehicles oroduction. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvante tontrol. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, so comfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solu Searching and solving faults. Technological Quality Aspects editation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of querification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and product and transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad transporting Devices Transporting Devices terial transport technology, loose material transport - conveyors with tractive elements, conveyors without tractive elements, transport devices, cyclic transport devices, crane mechanisms, steel constructions. Vertical transport, transport in mines, long-distance converted to the production of transport, including development and research. Colours, colour perception, colour schema, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics graphics software.	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ nality improvemenucers. KZ raffic safety. Sign KZ t of piece materi eyor belt transpor KZ nes, models, prin	d vehicle and 2 mechanism. 2 Conventional cation and 2 cy situations. 2 at. Conformity 2 al systems. 2 al - continual t. 2 nciples of 2D
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr 16Y1TR Legislation in railro 16Y1TZ Flow of masses, matranspor 16Y1ZG Computer graphics and 3D generatio	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantentrol. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, so comfort systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solutions Searching and solving faults. Technological Quality Aspects editation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of querification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and production. Theory of Railroad Vehicle Driving and transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad transport technology, loose material transport - conveyors with tractive elements, conveyors without tractive elements, transport devices, cyclic transport devices, crane mechanisms, steel constructions. Vertical transport, transport in mines, long-distance convertical transport devices and positions with emphasis on transport, including development and research. Colours, colour perception, colour schema, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ ution of emergen KZ raffic safety. Sign KZ	d vehicle and 2 mechanism. 2 Conventional cation and 2 cy situations. 2 cy situations. 2 al - continual t. 2 cociples of 2D 2D and 3D
16Y1RE Elementary concept and hybrid drive 16Y1RV Electric circuits in ra 16Y1TJ Certification and acr 16Y1TR Legislation in railro 16Y1TZ Flow of masses, matranspor 16Y1ZG Computer graphics and 3D generatio 16Y1ZL Vehicle, bus and mo	Operation, Construction and Maintenance of Vehicles production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measureme General principles of engine diagnostics. Control and Electronic Vehicle Systems sof regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvant sontrol. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, sometime communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, sometime communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, sometime communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, sometime communication systems. Railroad Vehicles Driving Iroad vehicles. Railroad vehicles. Rail traction technology. Solu Searching and solving faults. Technological Quality Aspects reditation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of questification. Workplace certification. QMS integration. Quality system creation. Tools and methods of questification. Environmental certification. Workplace certification. QMS integration. Quality system creation. Tools and methods of questification. Theory of Railroad Vehicle Driving and transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad traffic regulations. Railroad traffic regulations. Railroad traffic regulations with ransport technology, loose material transport - conveyors with tractive elements, conveyors without tractive elements, transport devices, cyclic transport devices, crane mechanisms, steel constructions. Vertical transport, transport in mines, long-distance converted to the production of transport, including development and research. Colours, colour perce	KZ nt. Transmission KZ ntages, function. safety, communic KZ ution of emergen KZ ution of emergen KZ raffic safety. Sign	d vehicle and 2 mechanism. 2 Conventional cation and 2 cy situations. 2 cy situations. 2 al - continual t. 2 cociples of 2D 2D and 3D

17TDL	Transport Technology and Logistics	Z,ZK	3
	sport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planting.		
transport. Organisa	ttion of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city tr	ansport. Logistic t	echnologies
17TC A	and their application using various transport means.		4
17TGA	Graph Theory and its Applications in Transport f graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in o	Z,ZK	I
17X31	Project 1	Z	2
17X31 17X32	Project 2	Z	2
17X32	Project 3	<u>Z</u>	2
17X33 17Y1AF	Alternative Forms of Transportation Project Financing	KZ	2
	Alternative Forms of mansportation Froject Financing		
	cipant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an altern	•	
	project.		
17Y1BB	Banks and Banking	KZ	2
_	system. Balance sheet, income statement, bank's capital and its functions. Banking risks. Banking products. Interest types, pay-off an	_	
products. Banking	deposit products. Banking payment-clearing products. Financial intermediation, open-end and closed-end funds, collective investmer its role. Bank regulation and supervision. International banking.	it schemes. Centra	al bank and
17Y1DZ	Transported Commodities Cognization	KZ	2
	Quality. Testing. Standardization. Features relevant for the transport. Packing. Stress. Protection of goods and damage prevention during		1
	of the choice and effective transport means utility.		
17Y1EV	Public Sector Economy	KZ	2
	ncial theory of public sector, public choice theory, externalites, decisions about public finance allocation, economic assessment of publ		
	R, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding fro		
17Y1LL	Logistics of Passenger and Freight Air Transport ssenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial trans	KZ	2
Logistics attitle pa	air cargo. Information systems in air transport. Allohal distribution systems. Aerial trans-	port process pass	serigers ariu
17Y1ND	Maritime Transportation	KZ	2
	ance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utiliza		
	asport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, mar	-	
	containers, ITS in maritime transport.		
18KIAD	Kinematics and Dynamics	Z,ZK	2
-	, motion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point mass		-
masses, equatio	n of motion. Method of Newton. Princle of D´Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impaction of vibration with multiple degrees of freedom.	at theory. Introduct	tion to the
18MRI1	Materials 1	Z,ZK	3
-	Basics of thermodynamics of metals and their alloys. Balanced binary diagrams. Alloys of iron with carbon. Deterioration of solid solu		_
,	steel and cast irons. Physical features. Mechanical features. Dephectostopic testing. Corosion.		· ·
18MRI2	Materials 2	KZ	2
	tal concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the		1
18PZP	Elasticity and Strength	Z,ZK	3
rension and compr	ression. Bending of beam. Shear stress in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted a Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability.	na welaea joints o	of structures.
18ST	Statics	Z,ZK	3
	of forces. Calculation of reactions of mass objects and compound systems. Assessment of internal forces on statically determinate be		1
	works. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction	-	
	of sections. Geometry of cross sections. Plane fiber polygons and catenary cables.		
18TTED	Creation of Technical Documentation	KZ	2
Technical standards	s, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, dimensic	onal and geometric	cal accuracy,
10721	arrangement of drawing sheets, types of schemes and their creation.	7	
18X31	Project 1	Z	2
18X32	Project 2	Z 	2
18X33	Project 3	KZ	2
18Y1AM	Anatomy, Mobility and Safety of Man natomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation a		1
=	of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured m	=	
	joint prostheses. Protective means and traffic safety regulations.		
18Y1D1	Dynamics of Routes and Vehicles 1	KZ	2
Theory and analys	sis of vibration of multimass systems. Dynamical model of vehicle and interaction with transport structure. Assessment of structure vib	oration and allowa	ble criteria.
	Vibroisolation and absorbers of dynamical effects. Methods of experimental dynamics. FEM in structure dynamics.		
18Y1EV	Experimental Methods and Numerical Modelling	KZ	2
	measured in structural mechanics and dynamics. Principles of strain gauge measurement. Theory of photoelasticimetry, experimental m numerical methods in structural mechanics and dynamics. Finite element method in statics and dynamics. Geometry development, dis		-
Zaolo pililoipies U	of structural elements. Boundary conditions. Material models. Solution of problems.		, types
18Y1MT	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		1
	ogical materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's	selection charts.	
18Y1P1	Design of Structures 1	KZ	2
	eam elements, virtual work. Strength method. Frame analysis by strength method. Deformation method. Frame analysis by deformation	· · · · · · · · · · · · · · · · · · ·	
Beam on elastic	Winkler's foundation. Calculation of beam on elastic foundation. Basics of the mathematical elasticity. Wall as a structural element. Pl. Statical function of shells. Examples of calculations.	ate as a structural	rnember.
	Gradual function of shells. Examples of calculations.		

Saliciary Normanione de beam demant vinual work. Steungth months Chemo autopus to treatment hands distribution method. Forma analysis to plateful production of the beam demant vinual work. Steungth months Chemo autopus to treatment and the beam demant vinual work. Steungth months Chemo autopus to the beam demands of the beam				1 -
and search on deaths Winkier's boundation. Carolatesion beam on eleasts from activation. Search on a feath Examples of activations. 18Y1UK Introduction of Rail Vehicles RZ Seasc Characteristics and parameters rail transport systems - reflexing with the transport of activations. The control of the contr	18Y1SN	Statically Nondeterminated Structures	KZ	2
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21Y1L	Airports - Design and Operation	KZ	2
Introductory conditions for	development of planning of runway systems and terminal facilities. Road construction, approximate analysis of RWY distance. Investment	ent plann	ing - operator
	activities. Certification of international airports - standard checking. Unexpected events and their handling.		
21Y1LC	Human Factor K	KZ	2
Human performace &	; limitations, ability & amp; competence, accident statistics, flight safety, basics of flight physiology, individuals & amp; environment, breathing	ning &am	p; circulation,
sensory system, health &	& samp; hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & and a supplied that the same information processing in the same information in the same information processing in the same information in the same inf	amp; lear	ning, theory
	& model of human error, biorhythms & sleep, stress, fatigue, working methods.		
21Y1LM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	KZ	2
•	Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospherical fronts. Atmospherical precipitation, origin & amp; category	_	
Forces producing wind. Cy	clone and anticyclone. Gradient wind. Geostrofical and geocyclostrophical wind. Visibilities in air transport. Dangerous meteorological as maps. Climatology. Circulation.Intertropical front. Meteorological information.	spects. M	leteorological
21Y1LR	Radio Technology in Aviation	KZ	2
Electric signals and the v	wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propag	gation. W	lave ranges
	in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.		
21Y1PU	Aircraft Maintenance Technology	KZ	2
'	Basics of aircraft maintenance technology, legislation, aircraft release into operation, safety, equipment.		
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