Study plan

Name of study plan: PRE bak. studium oboru LOG rozřazení v 19-20

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: 128
Elective courses credits: 52
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Compulsory courses
Minimal number of credits of the block: 116
The role of the block: Z

Code of the group: 1S PRE 18-19 P
Name of the group: 1. sem. bak. PRE 18-19 povinné předměty (spol. část studia)
Requirement credits in the group: In this group you have to gain 30 credits
Requirement courses in the group: In this group you have to complete 11 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
611CAL1	**Calculus 1** *Romana Zibnerová Ondřej Navrátil (Gar.)*	Z,ZK	7	2P+4C+22B	Z	z
611LA	**Linear Algebra** *Romana Zibnerová* ***Romana Zibnerová*** *Martina Bečvářová (Gar.)*	Z,ZK	3	2P+1C+10B	Z	z
612ZYDI	**Introduction to Transportation Engineering** *Dagmar Kočárková Dagmar Kočárková (Gar.)*	Z,ZK	2	1P+1C	Z	z
618MTY	**Materials Science and Engineering** *Vít Malinovský Jaroslav Valach (Gar.)*	Z,ZK	3	2P+1C+10B	Z	z
611GIE	**Geometry** *Vít Malinovský Šárka Voráčová (Gar.)*	KZ	3	2P+2C+12B	Z	z
614ASD	**Algorithm and Data Structures** *Jan Mejstřík*	KZ	3	0P+2C+8B	Z	z
614KSP	**Constructing with Computer Aid** *Libor Žídek*	KZ	2	0P+2C+8B	Z	z
618TED	**Technical Documentation** *Vít Malinovský Jitka Řezníčková (Gar.)*	KZ	2	1P+1C+8B	Z	z
615DPLG	**Transportation Psychology** *Jana Štikarová*	Z	2	2P+0C+6B	Z	z
616UDOP	**Introduction into Vehicles** *Zuzana Radová Petr Bouchner (Gar.)*	Z	2	2P+0C+8B	Z	z
TV-1	**Physical Education**	Z	1		Z	z

Characteristics of the courses of this group of Study Plan: Code=1S PRE 18-19 P Name=1. sem. bak. PRE 18-19 povinné předměty (spol. část studia)

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

618MTY	Materials Science and Engineering	Z,ZK	3
Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests.			
611GIE	Geometry	KZ	3
Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet`s trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path.			
614ASD	Algorithm and Data Structures	KZ	3
Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.			
614KSP	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 possibilites, AutoCAD environment profiles, drawings with raster foundaments).			
618TED	Technical Documentation	KZ	2
Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.			
615DPLG	Transportation Psychology	Z	2
Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.			
616UDOP	Introduction into Vehicles	Z	2
Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.			
TV-1	Physical Education	Z	1

Code of the group: 2S PRE 18-19 P
Name of the group: 2. sem. bak. PRE 18-19 povinné předměty (spol. část studia)
Requirement credits in the group: In this group you have to gain 30 credits
Requirement courses in the group: In this group you have to complete 9 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
611CAL2	**Calculus 2** *Romana Zibnerová* ***Romana Zibnerová*** *Ondřej Navrátil (Gar.)*	Z,ZK	5	2P+3C+20B	L	z
611STAT	**Statistics** *Pavel Provinský, Pavla Pecherková* ***Pavla Pecherková*** *Pavel Provinský (Gar.)*	Z,ZK	4	2P+2C+12B	L	z
612ZTS	**Railway Lines and Stations** *Tomáš Javořík, Ondřej Trešl*	Z,ZK	4	2P+2C+10B	L	z
618SAT	**Structural Analysis** *Tomáš Doktor Daniel Kytýř (Gar.)*	Z,ZK	4	2P+2C+14B	L	z
620SYSA	**Systems Analysis** *Petr Bureš, Jiří Růžička Zuzana Bělinová (Gar.)*	Z,ZK	5	2P+2C+14B	L	z
614PRG	**Programming** *Libor Žídek*	KZ	2	0P+2C+8B	L	z
617TEDL	**Transport Technology and Logistics** *Michal Drábek Vít Janoš (Gar.)*	KZ	3	2P+1C	L	z
621ZALD	**Basics of Air Transport** *Jakub Hospodka*	KZ	2	0P+2C+8B	L	z
TV-2	**Physical Education**	Z	1		L	z

Characteristics of the courses of this group of Study Plan: Code=2S PRE 18-19 P Name=2. sem. bak. PRE 18-19 povinné předměty (spol. část studia)

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

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

Code of the group: 3S PRE 19-20 P
Name of the group: 3. sem. bak. PRE 19-20 povinné předměty (SČS)
Requirement credits in the group: In this group you have to gain 30 credits
Requirement courses in the group: In this group you have to complete 8 courses
Credits in the group: 30
Note on the group:

Code	**Name of the course / Name of the group of courses** ***(in case of groups of courses the list of codes of their members)*** *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
611FYZ	**Physics** *Goce Chadzitaskos Zuzana Malá (Gar.)*	Z,ZK	5	2P+2C+18B	Z	z
612MDE	**Transport Models and Transport Excesses** *Josef Kocourek, Tomáš Padělek Josef Kocourek (Gar.)*	Z,ZK	3	2P+1C+8B	Z	z
617TGA	**Graph Theory and its Applications in Transport** *Alexandra Dvořáčková Denisa Mocková (Gar.)*	Z,ZK	4	2P+2C+12B	Z	z
618PZP	**Elasticity and Strength** *Tomáš Doktor Ondřej Jiroušek (Gar.)*	Z,ZK	3	2P+1C+10B	Z	z
620UITS	**Introduction to Intelligent Transport Systems** *Vladimír Faltus Pavel Hrubeš (Gar.)*	Z,ZK	7	3P+2C+20B	Z	z
612PPOK	**Designing Roads, Highways and Motorways** *Tomáš Padělek, Petr Kumpošt*	KZ	3	1P+2C+10B	Z	z
614DATS	**Database Systems** *Ondřej Smíšek Jana Kaliková (Gar.)*	KZ	2	1P+1C+10B	Z	z
615JZ1A	**Foreign Language - English 1** *Věra Pastorková*	Z	3	0P+4C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S PRE 19-20 P Name=3. sem. bak. PRE 19-20 povinné předměty (SČS)

611FYZ	Physics	Z,ZK	5
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
612MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.			
617TGA	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 routing, use of graphs in other scientific disciplines.			
618PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.			
620UITS	Introduction to Intelligent Transport Systems	Z,ZK	7
Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS.			
612PPOK	Designing Roads, Highways and Motorways	KZ	3
Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in 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.			
614DATS	Database Systems	KZ	2
Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.			

615JZ1A	Foreign Language - English 1	Z	3

Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.

Code of the group: 4S P LOG 19-20 P
Name of the group: 4. sem. PREZ bak. LOG 19-20 povinné předměty
Requirement credits in the group: In this group you have to gain 26 credits
Requirement courses in the group: In this group you have to complete 8 courses
Credits in the group: 26
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
611MSP	**Modeling of Systems and Processes** *Jana Kuklová, Bohumil Kovář Bohumil Kovář (Gar.)*	Z,ZK	4	2P+2C+12B	L	z
617LGT	**Logistics** *Daniel Pilát Tomáš Horák (Gar.)*	Z,ZK	6	3P+2C+18B	L	z
617SFID	**Public Administration and Financing in Transport**	Z,ZK	4	2P+1C+12B	L	z
611LP	**Linear Programming** *Šárka Voráčová, Ivan Nagy* ***Ivan Nagy*** *Šárka Voráčová (Gar.)*	KZ	3	2P+1C+12B	L	z
616DPO	**Vehicle Technology** *Josef Mík Josef Mík (Gar.)*	KZ	2	2P+0C+10B	L	z
617EMY	**Management Science**	Z	2	2P+0C+8B	L	z
617PAZ	**Carriage and Forwarding**	Z	2	2P+0C+8B	L	z
615JZ2A	**Foreign Language - English 2** *Věra Pastorková*	Z,ZK	3	0P+4C+10B	L	z

Characteristics of the courses of this group of Study Plan: Code=4S P LOG 19-20 P Name=4. sem. PREZ bak. LOG 19-20 povinné předměty

611MSP	Modeling of Systems and Processes	Z,ZK	4

System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection.

617LGT	Logistics	Z,ZK	6

Logistics definition, basic concepts, store, warehouse, transport and handling equipment, logistics technology, logistics centers, information and intelligent logistics systems, logistics city.

617SFID	Public Administration and Financing in Transport	Z,ZK	4

Basic issues of transport and transport policy in the social context, environmental issues in transport, economical aspects of transport, public administration and financing of transport.

611LP	Linear Programming	KZ	3

Formulation of the problem of linear programming, transcription of some practical problems to the linear programming problems. Simplex and convex polyedra. Simplex method, basic solutions, duality principle in linear programming, stability of solution of linear programming problem. Traffic problem.

616DPO	Vehicle Technology	KZ	2

Vehicle. Functions, principles. Drive, vehicle construction. Road transport, safety, heavy duty vehicle desing, dynamics. Rail transport, safety, carriage design. Drive. Electric traction. Transshipment. Technological components of various modes of transport. Management and control of various means of transport. Safety.

617EMY	Management Science	Z	2

The introduction to economical-mathematical models before its application in concrete technical and economical cases. The basic mathematical methods to modelise economical situations. Several classes of problems are formulated and different methods used in qualitatively distinct real situations are introduced. The tasks of interpretation and application.

617PAZ	Carriage and Forwarding	Z	2

Contracts of carriage and forwarding, waybills and documents; transport modes, multimodal transport, tariffs and prices in transport, rights and obligations of carriers, hauliers and forwarders, duty and tariff agreements, INCOTERMS, insurance in transport.

615JZ2A	Foreign Language - English 2	Z,ZK	3

Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.

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

Code of the group: PROJ 19-20
Name of the group: projekty 19-20 (4., 5., 6. sem.)
Requirement credits in the group: In this group you have to gain 6 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 6
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
615X31	**Project 1**	Z	2	0P+1C	L	ZP
620X31	**Project 1**	Z	2	0P+1C	L	ZP
612X31	**Project 1**	Z	2	0P+1C	L	ZP
622X31	**Project 1**	Z	2	0P+1C	L	ZP
617X31	**Project 1**	Z	2	0P+1C	L	ZP
616X31	**Project 1**	Z	2	0P+1C	L	ZP
617X32	**Project 2**	Z	2	0P+2C	Z	ZP
622X32	**Project 2**	Z	2	0P+2C	Z	ZP
612X32	**Project 2**	Z	2	0P+2C	Z	ZP
620X32	**Project 2**	Z	2	0P+2C	Z	ZP
615X32	**Project 2**	Z	2	0P+2C	Z	ZP
616X32	**Project 2**	Z	2	0P+2C	Z	ZP
616X33	**Project 3**	Z	2	0P+1C	L	ZP
620X33	**Project 3**	Z	2	0P+1C	L	ZP
615X33	**Project 3**	Z	2	0P+1C	L	ZP
612X33	**Project 3**	Z	2	0P+1C	L	ZP
622X33	**Project 3**	Z	2	0P+1C	L	ZP
617X33	**Project 3**	Z	2	0P+1C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=PROJ 19-20 Name=projekty 19-20 (4., 5., 6. sem.)

615X31	Project 1	Z	2
620X31	Project 1	Z	2
612X31	Project 1	Z	2
622X31	Project 1	Z	2
617X31	Project 1	Z	2
616X31	Project 1	Z	2
617X32	Project 2	Z	2
622X32	Project 2	Z	2
612X32	Project 2	Z	2
620X32	Project 2	Z	2
615X32	Project 2	Z	2
616X32	Project 2	Z	2
616X33	Project 3	Z	2
620X33	Project 3	Z	2
615X33	Project 3	Z	2
612X33	Project 3	Z	2
622X33	Project 3	Z	2
617X33	Project 3	Z	2

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 6
The role of the block: PV

Code of the group: PVP PRE 19-20
Name of the group: 3x PVP pro bak. PREZ od 19-20: LOG (1x v 4. sem. ,1x PVP v 5.sem., 1x PVP v 6.sem.)
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
620Y1AF	**Alternative Forms of Transportation Project Financing**	KZ	2	2P+0C	Z	PV
618Y1AM	**Anatomy, Mobility and Safety of Man**	KZ	2	2P+0C	Z	PV

614Y1AV	**Animation and Visualization**	KZ	2	2P+0C	L	PV
620Y1AE	**Applied Electronics**	KZ	2	2P+0C	Z	PV
614Y1BE	**Barrierless Transport**	KZ	2	2P+0C	L	PV
621Y1BC	**Aviation safety and security**	KZ	2	2P+0C	L	PV
615Y1BO	**Work Safety and Health Protection in Transportation**	KZ	2	2P+0C	L	PV
621Y1BS	**Unmanned aircraft systems 1**	KZ	2	2P+0C	L	PV
614Y1BM	**Biometric Methods**	KZ	2	2P+0C	Z	PV
623Y1DZ	**Data and Their Processing for Engineering Fields Needs**	KZ	2	2P+0C	Z	PV
615Y1DZ	**History of Railway**	KZ	2	2P+0C	L	PV
612Y1DS	**Project Documentation in Practice**	KZ	2	2P+0C	Z	PV
620Y1EK	**Qualification in Electrical Engineering**	KZ	2	2P+0C	L	PV
616Y1EN	**Energy Requirements of Vehicles**	KZ	2	2P+0C	L	PV
620Y1EA	**Environmental Aspects of Transport**	KZ	2	2P+0C	Z	PV
615Y1EH	**European Integration within Historical Context**	KZ	2	2P+0C	Z	PV
618Y1EM	**Experimental Methods in Mechanics**	KZ	2	2P+0C	Z	PV
615Y1FD	**French Area Studies and Transportation**	KZ	2	2P+0C	L	PV
614Y1HW	**Computer Hardware**	KZ	2	2P+0C	L	PV
615Y1HL	**History of Civil Aviation**	KZ	2	2P+0C	Z	PV
615Y1HD	**History of City Mass Transport**	KZ	2	2P+0C	Z	PV
612Y1HD	**Traffic Noise**	KZ	2	2P+0C	L	PV
615Y1HE	**Work Hygiene and Ergonomics in Traffic** *Petr Musil*	KZ	2	2P+0C	Z	PV
616Y1IS	**Interactive simulators and simulations** *Libor Žídek, Ondřej Smíšek, Ondřej Piksa, Martin Scháno, Jiří Zeisek*	KZ	2	2P+0C	L	PV
612Y1KN	**Combined Transportation**	KZ	2	2P+0C	Z	PV
623Y1KO	**Quantum Physics and Optoelectronics**	KZ	2	2P+0C	L	PV
617Y1LL	**Logistics of Passenger and Freight Air Transport**	KZ	2	2P+0C	L	PV
620Y1LN	**Location and Navigation**	KZ	2	2P+0C	L	PV
617Y1MD	**Marketing in Transportation** *Alexandra Dvořáčková*	KZ	2	2P+0C	Z	PV
611Y1MM	**Mathematical Models in Economy**	KZ	2	2P+0C	Z	PV
618Y1MT	**Engineering Materials**	KZ	2	2P+0C	L	PV
621Y1MP	**Matlab for project-oriented study**	KZ	2	2P+0C	Z	PV
614Y1MP	**Modeling Complex Assemblies and Models in Parametric Modeller**	KZ	2	2P+0C	Z	PV
615Y1MK	**Modern History in Context: Every Day Life and Transport**	KZ	2	2P+0C	L	PV
615Y1NE	**German in the Economy and Society**	KZ	2	2P+0C	Z	PV
623Y1OK	**Protection of Critical Objects and Infrastructures**	KZ	2	2P+0C	L	PV
620Y1OI	**Fare Collection and Information Systems**	KZ	2	2P+0C	L	PV
614Y1OJ	**Object - oriented programming in JAVA**	KZ	2	2P+0C	L	PV
614Y1OP	**Operating System**	KZ	2	2P+0C	Z	PV
617Y1OF	**Personal Finance** *Alexandra Dvořáčková*	KZ	2	2P+0C	Z	PV
620Y1OK	**Road Lighting**	KZ	2	2P+0C	L	PV
611Y1PV	**Parametrical and Multicriterial Programming**	KZ	2	2P+0C	Z	PV
617Y1PM	**Personnel Management** *Stanislava Holíková*	KZ	2	2P+0C	L	PV
612Y1PC	**Pedestrian and Cycling Transport**	KZ	2	2P+0C	L	PV
614Y1PG	**Computer Graphics**	KZ	2	2P+0C	L	PV
614Y1P2	**Computer Aid of Transportation Projecting 2**	KZ	2	2P+0C	Z	PV
618Y1PS	**Computer Simulations in Mechanics**	KZ	2	2P+0C	L	PV
614Y1PI	**Corporate Information System**	KZ	2	2P+0C	Z	PV
614Y1PZ	**Advanced Data Processing in Spreadsheets**	KZ	2	2P+0C	Z	PV
612Y1PD	**Assessment of Transport**	KZ	2	2P+0C	Z	PV
620Y1PK	**Product Quality Management Processes**	KZ	2	2P+0C	Z	PV
614Y1PJ	**C Programming Language**	KZ	2	2P+0C	Z	PV

612Y1C1	**Designing Roads in Civil 3D I**	KZ	2	2P+0C	L	PV
612Y1C2	**Designing Roads in Civil 3D II**	KZ	2	2P+0C	Z	PV
614Y1PA	**3D Modeling in AutoCAD**	KZ	2	2P+0C	Z	PV
616Y1PV	**Operation, Construction and Maintenance of Vehicles**	KZ	2	2P+0C	L	PV
612Y1PU	**Organization Disposition of Railway Stations**	KZ	2	2P+0C	L	PV
616Y1RE	**Control and Electronic Vehicle Systems**	KZ	2	2P+0C	Z	PV
621Y1RZ	**Human Resources Management**	KZ	2	2P+0C	L	PV
617Y1ST	**Titan Simulation**	KZ	2	2P+0C	L	PV
620Y1SC	**Sensors and Actuators**	KZ	2	2P+0C	L	PV
617Y1SL	**Sociology of Human Resources** *Stanislava Holíková*	KZ	2	2P+0C	Z	PV
611Y1SI	**Transportation Software Engineering**	KZ	2	2P+0C	Z	PV
622Y1SZ	**Forensic Expertise**	KZ	2	2+0	L	PV
616Y1KS	**Quality and Reliability of Vehicles**	KZ	2	2P+0C	Z	PV
612Y1SU	**Management and Maintenance of Roads**	KZ	2	2P+0C	L	PV
617Y1SK	**Urban and Regional Rail Transport Systems**	KZ	2	2P+0C	L	PV
621Y1TH	**Aircraft Technical Handling**	KZ	2	2P+0C	Z	PV
611Y1TG	**Graph Theory**	KZ	2	2P+0C	L	PV
614Y1TI	**Creating Interactive Internet Applications**	KZ	2	2P+0C	L	PV
614Y1UP	**Editing of Theses in MS Word**	KZ	2	2P+0C	L	PV
618Y1UK	**Introduction of Rail Vehicles**	KZ	2	2P+0C	L	PV
612Y1VC	**Waterways and Shipping**	KZ	2	2P+0C	Z	PV
623Y1VS	**Negotiation and Cooperation**	KZ	2	2P+0C	Z	PV
614Y1VM	**Development of Applications for Mobile Devices**	KZ	2	2P+0C	Z	PV
616Y1VT	**Development in Railroad Vehicles**	KZ	2	2P+0C	L	PV
614Y1W1	**Webdesign 1**	KZ	2	2P+0C	Z	PV
614Y1W2	**Webdesign 2**	KZ	2	2P+0C	L	PV
616Y1ZG	**Introduction into Applied Computer Graphics**	KZ	2	2P+0C	L	PV
614Y1ZM	**Fundamentals of parametric and adaptive modeling**	KZ	2	2P+0C	L	PV
611Y1ZM	**Foundation of MATLAB Programming** *Šárka Voráčová*	KZ	2	2P+0C	L	PV
612Y1ZU	**Principles of Urbanism**	KZ	2	2P+0C	Z	PV
615Y1ZV	**East-West dichotomy: Prelude to the Cold War**	KZ	2	2P+0C	Z	PV
616Y1ZL	**Vehicle Testing, Legislation and Construction**	KZ	2	2P+0C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=PVP PRE 19-20 Name=3x PVP pro bak. PREZ od 19-20: LOG (1x v 4. sem. ,1x PVP v 5.sem., 1x PVP v 6.sem.)

620Y1AF	Alternative Forms of Transportation Project Financing	KZ	2

In will be specifed such forms of financing in transportation and telecomunications, where the public sector body perform the final debtor, i. e. debt payments come from its budget but the 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 alternative source of transportation and telecomunication projects.

618Y1AM	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 system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.

614Y1AV	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 Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.

620Y1AE	Applied Electronics	KZ	2

Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).

614Y1BE	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 will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.

621Y1BC	Aviation safety and security	KZ	2

History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.

615Y1BO	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. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.

621Y1BS	Unmanned aircraft systems 1	KZ	2
Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.			
614Y1BM	Biometric Methods	KZ	2
Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.			
623Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2
Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants´ creation, decision support systems.			
615Y1DZ	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 Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.			
612Y1DS	Project Documentation in Practice	KZ	2
Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.			
620Y1EK	Qualification in Electrical Engineering	KZ	2
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.			
616Y1EN	Energy Requirements of Vehicles	KZ	2
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.			
620Y1EA	Environmental Aspects of Transport	KZ	2
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.			
615Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.			
618Y1EM	Experimental Methods in Mechanics	KZ	2
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.			
615Y1FD	French Area Studies and Transportation	KZ	2
France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.			
614Y1HW	Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
615Y1HL	History of Civil Aviation	KZ	2
Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.			
615Y1HD	History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments 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 Slovakia.			
612Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
615Y1HE	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 these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.			
616Y1IS	Interactive simulators and simulations	KZ	2
Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.			
612Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
623Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
617Y1LL	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 transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
620Y1LN	Location and Navigation	KZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.			
617Y1MD	Marketing in Transportation	KZ	2
General principles of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport and the resulting differences in the application of marketing.			

611Y1MM	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 program implementation. The outcom of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.			
618Y1MT	Engineering Materials	KZ	2
Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, 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 charts.			
621Y1MP	Matlab for project-oriented study	KZ	2
The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises will be prepared according to particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement of students' Matlab skills.			
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.			
615Y1MK	Modern History in Context: Every Day Life and Transport	KZ	2
Historical overview of modern history of every day life, science, technology and transport in a wider context.			
615Y1NE	German in the Economy and Society	KZ	2
Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.			
623Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.			
620Y1OI	Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).			
614Y1OJ	Object - oriented programming in JAVA	KZ	2
Objective Thinking, Encapsulation, Classes, Attributes, Access Modifiers, Methods and Overloading, Special Methods (Constructors, Getters / Setters ..), Basic Object Methods, Reference Data Types, Inheritance, Polymorphism, Statics, constants, interfaces, abstract classes, enum, packages, exceptions, collections, generics, lambda expressions, anonymous functions			
614Y1OP	Operating System	KZ	2
Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processess. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.			
617Y1OF	Personal Finance	KZ	2
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
620Y1OK	Road Lighting	KZ	2
Basic lighting quantities and terms, street lighting components (luminaires, control cabinets for street lighting, street lighting cables), characteristics of luminaires (lifetime of light sources, light distribution), standards, measurement of illuminance and luminance in road lighting, tunnels, conceptual approach to street lighting design, lighting calculations in DIALux and Relux, street lighting control systems.			
611Y1PV	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 constraints. Computation of efficient solution.			
617Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
612Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
614Y1PG	Computer Graphics	KZ	2
Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.			
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.			
618Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.			
614Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics.			
614Y1PZ	Advanced Data Processing in Spreadsheets	KZ	2
Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and functions, including addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.			
612Y1PD	Assessment of Transport	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			

620Y1PK	Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.			
614Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise oprerators.			
612Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			
612Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
614Y1PA	3D Modeling in AutoCAD	KZ	2
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.			
616Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
612Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			
616Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.			
621Y1RZ	Human Resources Management	KZ	2
The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			
617Y1ST	Titan Simulation	KZ	2
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
620Y1SC	Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.			
617Y1SL	Sociology of Human Resources	KZ	2
Human resources and their importance, work group as a special kind of social group, communication, personal management, modern management, human resources planning, culture of the organization.			
611Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usuage.			
622Y1SZ	Forensic Expertise	KZ	2
Historical evolution of forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report.			
616Y1KS	Quality and Reliability of Vehicles	KZ	2
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturying, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.			
612Y1SU	Management and Maintenance of Roads	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
617Y1SK	Urban and Regional Rail Transport Systems	KZ	2
Factors affecting transport demand, modal-split, distribution of passenger flows on public regional transport lines. Optimization of line management, line networking. Creating and evaluation of the timetable. Vehicle circulation creation. Optimizing driver shifts and arranging them in turnus. Effects of barrier-free and public transport preferences. The role of marketing.			
621Y1TH	Aircraft Technical Handling	KZ	2
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-acing and anti-icing units. Loading and unloading units. Equipment for passangers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
611Y1TG	Graph Theory	KZ	2
Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity,dealing with NP-complete problems, heuris			
614Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.			

614Y1UP	Editing of Theses in MS Word	KZ	2
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of contents, lists of figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing dissertations and theses, so that they are able to concentrate mainly on writing a thesis.			
618Y1UK	Introduction of Rail Vehicles	KZ	2
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.			
612Y1VC	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. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
623Y1VS	Negotiation and Cooperation	KZ	2
Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.			
614Y1VM	Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.			
616Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.			
614Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.			
614Y1W2	Webdesign 2	KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.			
616Y1ZG	Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.			
614Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
611Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
612Y1ZU	Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spacial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			
615Y1ZV	East-West dichotomy: Prelude to the Cold War	KZ	2
Historical prologue, evolution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuity of the international relations in the end of 19th century and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the causes and consequences. Economic and financial history. Social changes. Discussions on texts, sources.			
616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle costruction, aggregate computing, driving resistance, building and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, creation of technical legislation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
611CAL1	Calculus 1	Z,ZK	7
Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Euklidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.			
611CAL2	Calculus 2	Z,ZK	5
Antiderivative, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Parametric description of regular k-dimensional surfaces in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems.			
611FYZ	Physics	Z,ZK	5
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
611GIE	Geometry	KZ	3
Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet`s trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path.			

611LA	Linear Algebra	Z,ZK	3
Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.			
611LP	Linear Programming	KZ	3
Formulation of the problem of linear programming, transcription of some practical problems to the linear programming problems. Simplex and convex polyedra. Simplex method, basic solutions, duality principle in linear programming, stability of solution of linear programming problem. Traffic problem.			
611MSP	Modeling of Systems and Processes	Z,ZK	4
System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection.			
611STAT	Statistics	Z,ZK	4
Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.			
611Y1MM	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 program implementation. The outcom of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.			
611Y1PV	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 constraints. Computation of efficient solution.			
611Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usuage.			
611Y1TG	Graph Theory	KZ	2
Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity,dealing with NP-complete problems, heuris			
611Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
612MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.			
612PPOK	Designing Roads, Highways and Motorways	KZ	3
Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in 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.			
612X31	Project 1	Z	2
612X32	Project 2	Z	2
612X33	Project 3	Z	2
612Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			
612Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
612Y1DS	Project Documentation in Practice	KZ	2
Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.			
612Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
612Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
612Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
612Y1PD	Assessment of Transport	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			
612Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			

612Y1SU	Management and Maintenance of Roads	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
612Y1VC	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. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
612Y1ZU	Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spacial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			
612ZTS	Railway Lines and Stations	Z,ZK	4
Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.			
612ZYDI	Introduction to Transportation Engineering	Z,ZK	2
Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.			
614ASD	Algorithm and Data Structures	KZ	3
Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.			
614DATS	Database Systems	KZ	2
Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.			
614KSP	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 possibilites, AutoCAD environment profiles, drawings with raster foundaments).			
614PRG	Programming	KZ	2
Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.			
614Y1AV	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 Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.			
614Y1BE	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 will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.			
614Y1BM	Biometric Methods	KZ	2
Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.			
614Y1HW	Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.			
614Y1OJ	Object - oriented programming in JAVA	KZ	2
Objective Thinking, Encapsulation, Classes, Attributes, Access Modifiers, Methods and Overloading, Special Methods (Constructors, Getters / Setters ..), Basic Object Methods, Reference Data Types, Inheritance, Polymorphism, Statics, constants, interfaces, abstract classes, enum, packages, exceptions, collections, generics, lambda expressions, anonymous functions			
614Y1OP	Operating System	KZ	2
Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processess. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.			
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.			
614Y1PA	3D Modeling in AutoCAD	KZ	2
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.			
614Y1PG	Computer Graphics	KZ	2
Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.			
614Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics.			

614Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise oprerators.			
614Y1PZ	Advanced Data Processing in Spreadsheets	KZ	2
Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and functions, including addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.			
614Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.			
614Y1UP	Editing of Theses in MS Word	KZ	2
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of contents, lists of figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing dissertations and theses, so that they are able to concentrate mainly on writing a thesis.			
614Y1VM	Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.			
614Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.			
614Y1W2	Webdesign 2	KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.			
614Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
615DPLG	Transportation Psychology	Z	2
Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.			
615JZ1A	Foreign Language - English 1	Z	3
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			
615JZ2A	Foreign Language - English 2	Z,ZK	3
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			
615X31	Project 1	Z	2
615X32	Project 2	Z	2
615X33	Project 3	Z	2
615Y1BO	Work Safety and Health Protection in Transportation	KZ	2
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
615Y1DZ	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 Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.			
615Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.			
615Y1FD	French Area Studies and Transportation	KZ	2
France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.			
615Y1HD	History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments 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 Slovakia.			
615Y1HE	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 these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.			
615Y1HL	History of Civil Aviation	KZ	2
Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.			
615Y1MK	Modern History in Context: Every Day Life and Transport	KZ	2
Historical overview of modern history of every day life, science, technology and transport in a wider context.			
615Y1NE	German in the Economy and Society	KZ	2
Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.			

615Y1ZV	East-West dichotomy: Prelude to the Cold War	KZ	2
Historical prologue, evolution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuity of the international relations in the end of 19th century and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the causes and consequences. Economic and financial history. Social changes. Discussions on texts, sources.			
616DPO	Vehicle Technology	KZ	2
Vehicle. Functions, principles. Drive, vehicle construction. Road transport, safety, heavy duty vehicle desing, dynamics. Rail transport, safety, carriage design. Drive. Electric traction. Transshipment. Technological components of various modes of transport. Management and control of various means of transport. Safety.			
616UDOP	Introduction into Vehicles	Z	2
Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.			
616X31	Project 1	Z	2
616X32	Project 2	Z	2
616X33	Project 3	Z	2
616Y1EN	Energy Requirements of Vehicles	KZ	2
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.			
616Y1IS	Interactive simulators and simulations	KZ	2
Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.			
616Y1KS	Quality and Reliability of Vehicles	KZ	2
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturying, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.			
616Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
616Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.			
616Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.			
616Y1ZG	Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.			
616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle costruction, aggregate computing, driving resistance, building and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, creation of technical legislation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.			
617EMY	Management Science	Z	2
The introduction to economical-mathematical models before its application in concrete technical and economical cases. The basic mathematical methods to modelise economical situations. Several classes of problems are formulated and different methods used in qualitatively distinct real situations are introduced. The tasks of interpretation and application.			
617LGT	Logistics	Z,ZK	6
Logistics definition, basic concepts, store, warehouse, transport and handling equipment, logistics technology, logistics centers, information and intelligent logistics systems, logistics city.			
617PAZ	Carriage and Forwarding	Z	2
Contracts of carriage and forwarding, waybills and documents; transport modes, multimodal transport, tariffs and prices in transport, rights and obligations of carriers, hauliers and forwarders, duty and tariff agreements, INCOTERMS, insurance in transport.			
617SFID	Public Administration and Financing in Transport	Z,ZK	4
Basic issues of transport and transport policy in the social context, environmental issues in transport, economical aspects of transport, public administration and financing of transport.			
617TEDL	Transport Technology and Logistics	KZ	3
Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in pasanger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their aplication using various transport modus.			
617TGA	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 routing, use of graphs in other scientific disciplines.			
617X31	Project 1	Z	2
617X32	Project 2	Z	2
617X33	Project 3	Z	2
617Y1LL	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 transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
617Y1MD	Marketing in Transportation	KZ	2
General principles of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport and the resulting differences in the application of marketing.			
617Y1OF	Personal Finance	KZ	2
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			

617Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
617Y1SK	Urban and Regional Rail Transport Systems	KZ	2
Factors affecting transport demand, modal-split, distribution of passenger flows on public regional transport lines. Optimization of line management, line networking. Creating and evaluation of the timetable. Vehicle circulation creation. Optimizing driver shifts and arranging them in turnus. Effects of barrier-free and public transport preferences. The role of marketing.			
617Y1SL	Sociology of Human Resources	KZ	2
Human resources and their importance, work group as a special kind of social group, communication, personal management, modern management, human resources planning, culture of the organization.			
617Y1ST	Titan Simulation	KZ	2
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
618MTY	Materials Science and Engineering	Z,ZK	3
Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests.			
618PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.			
618SAT	Structural Analysis	Z,ZK	4
General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.			
618TED	Technical Documentation	KZ	2
Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.			
618Y1AM	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 system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.			
618Y1EM	Experimental Methods in Mechanics	KZ	2
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.			
618Y1MT	Engineering Materials	KZ	2
Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, 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 charts.			
618Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.			
618Y1UK	Introduction of Rail Vehicles	KZ	2
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.			
620SYSA	Systems Analysis	Z,ZK	5
Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis.			
620UITS	Introduction to Intelligent Transport Systems	Z,ZK	7
Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS.			
620X31	Project 1	Z	2
620X32	Project 2	Z	2
620X33	Project 3	Z	2
620Y1AE	Applied Electronics	KZ	2
Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).			
620Y1AF	Alternative Forms of Transportation Project Financing	KZ	2
In will be specifed such forms of financing in transportation and telecomunications, where the public sector body perform the final debtor, i. e. debt payments come from its budget but the 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 alternative source of transportation and telecomunication projects.			
620Y1EA	Environmental Aspects of Transport	KZ	2
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.			

620Y1EK	Qualification in Electrical Engineering	KZ	2
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.			
620Y1LN	Location and Navigation	KZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.			
620Y1OI	Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).			
620Y1OK	Road Lighting	KZ	2
Basic lighting quantities and terms, street lighting components (luminaires, control cabinets for street lighting, street lighting cables), characteristics of luminaires (lifetime of light sources, light distribution), standards, measurement of illuminance and luminance in road lighting, tunnels, conceptual approach to street lighting design, lighting calculations in DIALux and Relux, street lighting control systems.			
620Y1PK	Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.			
620Y1SC	Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.			
621Y1BC	Aviation safety and security	KZ	2
History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.			
621Y1BS	Unmanned aircraft systems 1	KZ	2
Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.			
621Y1MP	Matlab for project-oriented study	KZ	2
The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises will be prepared according to particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement of students' Matlab skills.			
621Y1RZ	Human Resources Management	KZ	2
The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			
621Y1TH	Aircraft Technical Handling	KZ	2
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-acing and anti-icing units. Loading and unloading units. Equipment for passangers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
621ZALD	Basics of Air Transport	KZ	2
History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.			
622X31	Project 1	Z	2
622X32	Project 2	Z	2
622X33	Project 3	Z	2
622Y1SZ	Forensic Expertise	KZ	2
Historical evolution of forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report.			
623Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2
Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants´ creation, decision support systems.			
623Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
623Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.			
623Y1VS	Negotiation and Cooperation	KZ	2
Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.			
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1

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