Study plan

Name of study plan: Bachelor TET-DOS Full-Time from 2023/24

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

Name of the block: Compulsory courses
Minimal number of credits of the block: 158
The role of the block: Z

Code of the group: 1S-BP-TET-22/23-DC
Name of the group: 1st Sem. Bachelor Full-Time TET from 2022/23
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**	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**	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**	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-BP-TET-22/23-DC Name=1st Sem. Bachelor Full-Time TET from 2022/23

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. Indefinite integral, Newton integral, Riemann integral, improper Riemann integral. First-order differential equations, linear differential equations.			
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-BP-TET-22/22-DC
Name of the group: 2nd Sem. Bachelor Full-Time TET from 2022/23
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, Ondřej Navrátil, Magdalena Hykšová, Olga Vraštilová, Tomáš Třasák* ***Romana Zibnerová*** *Ondřej Navrátil (Gar.)*	Z,ZK	5	2P+3C+20B	L	z
611STAT	**Statistics** *Pavel Provinský, Evženie Uglickich, Pavla Pecherková, Michal Matowicki* ***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, Eva Hajčiarová, 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-BP-TET-22/22-DC Name=2nd Sem. Bachelor Full-Time TET from 2022/23

611CAL2	Calculus 2	Z,ZK	5
Linear differential equations and their systems, differential calculus of functions of several real variables. Riemann integral in Rn. Line and surface integrals.			
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-BP-TET-23/24-DC
Name of the group: 3rd Sem. Bachelor Full-Time TET from 2023/24
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**	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** *Josef Kocourek, 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** *Jan Feit*	Z	3	0P+4C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S-BP-TET-23/24-DC Name=3rd Sem. Bachelor Full-Time TET from 2023/24

611FYZ	Physics	Z,ZK	5
Kinematics, dynamics, Newton's laws, force fields, mechanics of continuum, thermodynamics, introduction to electrostatics and electric current.			
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-BP-DOS-23/24-DC
Name of the group: 4th Sem. Bachelor Full-Time TET-DOS from 2023/24
Requirement credits in the group: In this group you have to gain 16 credits

Requirement courses in the group: In this group you have to complete 4 courses
Credits in the group: 16
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
616DOKY	**Vehicle Technology** *Josef Mík, Josef Svoboda, Přemysl Toman Josef Mík (Gar.)*	Z,ZK	5	2P+2C	L	z
618KIDY	**Kinematics and Dynamics** *Vít Malinovský, Tomáš Fíla Tomáš Fíla (Gar.)*	Z,ZK	4	2P+2C	L	z
615JZ2A	**Foreign Language - English 2** *Jan Feit, Karolina Beauxisová, Věra Pastorková*	Z,ZK	3	0P+4C+10B	L	z

Characteristics of the courses of this group of Study Plan: Code=4S-BP-DOS-23/24-DC Name=4th Sem. Bachelor Full-Time TET-DOS from 2023/24

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.			
616DOKY	Vehicle Technology	Z,ZK	5
Technical nomenclature in transportation technology. Vehicle in legislation. Design. Operation. Influence on environment. Vehicle and ecology. Traction engine characteristics - combustion engines, electric engines, change of energy principles. Powertrain construction. Power transmission. Brake systems.			
618KIDY	Kinematics and Dynamics	Z,ZK	4
Friction. Motion along a line and a curve. Kinematics of rigid body. Kinematics of the point mass and the system of mass points. Dynamics of a mass point and a system of mass points, equation of motion. Method of Newton. D'Alembert principle. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with two degrees of freedom.			
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.			

Code of the group: 4S-BP-DOS-V1-23/24-D
Name of the group: 4th Sem. Bachelor Full-Time TET-DOS 1st alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 4 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 4
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
611EMOP	**Electromagnetic Field and Optics** *Kurt Fišer **Kurt Fišer** Kurt Fišer (Gar.)*	Z,ZK	4	2P+2C	L	z
612SDK	**Highways, Motorways and Intersections** *Josef Kocourek, Tomáš Padělek, Petr Kumpošt Josef Kocourek (Gar.)*	Z,ZK	4	2P+2C	L	z

Characteristics of the courses of this group of Study Plan: Code=4S-BP-DOS-V1-23/24-D Name=4th Sem. Bachelor Full-Time TET-DOS 1st alternative subject from 2023/24

611EMOP	Electromagnetic Field and Optics	Z,ZK	4
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			
612SDK	Highways, Motorways and Intersections	Z,ZK	4
Roads and motorways network, transport output. Types of direction curves. Hairpin bend. Stopping sight distance and overtaking sight distance. Levels of traffic service. Design elements of crossroads and intersections. Crossroads. Roundabouts. Intersections. Special types of junctions. Capacity of crossroads and intersections. Structure of pavement of roads and motorways. Road engineering structures. Assessment of route alternatives.			

Code of the group: 4S-BP-DOS-V2-23/24-D
Name of the group: 4th Sem. Bachelor Full-Time TET-DOS 2nd alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
611MDSD	**Collecting and Processing of Traffic Data** *Michal Matowicki, Petr Bureš, Ondřej Přibyl **Ondřej Přibyl** Ondřej Přibyl (Gar.)*	KZ	3	2P+0C	L	z
612PUSS	**Organization Disposition of Railway Stations** *Martin Jacura*	KZ	3	2P+0C	L	z

Characteristics of the courses of this group of Study Plan: Code=4S-BP-DOS-V2-23/24-D Name=4th Sem. Bachelor Full-Time TET-DOS 2nd alternative subject from 2023/24

611MDSD	Collecting and Processing of Traffic Data	KZ	3
Basic principles of traffic detection and data collection, specific problems of the field of traffic data. Data preprocessing and analysis for use in additional applications.			
612PUSS	Organization Disposition of Railway Stations	KZ	3
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.			

Code of the group: 4S-BP-DOS-V3-23/24-D
Name of the group: 4th Sem. Bachelor Full-Time TET-DOS 3rd alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
614PODP	**Computer Aid of Transportation Projecting** *Drahomír Schmidt*	KZ	3	0P+2C	L	z
618MECK	**Mechanics of Constructions** *Vít Malinovský, Petr Koudelka Petr Koudelka (Gar.)*	KZ	3	2P+0C	L	z

Characteristics of the courses of this group of Study Plan: Code=4S-BP-DOS-V3-23/24-D Name=4th Sem. Bachelor Full-Time TET-DOS 3rd alternative subject from 2023/24

614PODP	Computer Aid of Transportation Projecting	KZ	3
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.			
618MECK	Mechanics of Constructions	KZ	3
Energetic solution of elastic beam. Solution of statically indeterminate systems - force and deformation method. Stiffness and compliance matrix of a system. Finite difference method. History and fundamentals of structural design. Characteristics of steel, design of steel structures. Introduction to mathematical theory of elasticity in 3D.			

Code of the group: 5S-BP-DOS-23/24-DC
Name of the group: 5th Sem. Bachelor Full-Time TET-DOS from 2023/24
Requirement credits in the group: In this group you have to gain 10 credits
Requirement courses in the group: In this group you have to complete 2 courses
Credits in the group: 10
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
612ZELP	**Railway Operation** *Tomáš Javořík*	Z,ZK	4	2P+2C	Z	z
622DON	**Traffic Accidents** *Michal Frydrýn, Tomáš Mičunek, Luboš Nouzovský, Tomáš Kohout **Luboš Nouzovský** Tomáš Mičunek (Gar.)*	Z,ZK	6	3P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5S-BP-DOS-23/24-DC Name=5th Sem. Bachelor Full-Time TET-DOS from 2023/24

612ZELP	Railway Operation	Z,ZK	4
Legislation in railway transport. Railway vehicles. Railway signals and signal devices. Railway traffic organisation and operation. Simplified railway traffic operation. Railway vehicles brakes. Railway vehicles marking. Operation intervals. Theoretical graph of train running.			
622DON	Traffic Accidents	Z,ZK	6
Introduction to Road Accidents and Forensic Expertise; Rail, Water and Air Accidents; Road Accident Documentation and Documentation Technology; Accident Data Recorders - EDR Systems; Road Accident Trace Analysis and Fake Accidents; Simulation Programmes for Road Accident Analysis; Pedestrian and Cyclist Accidents; Vehicle technologies and systems and autonomous vehicles; Safe road layout and collision diagrams; Not giving right of way; Technical defects of vehicles; Restraints - passive road safety; Accidents at level crossings; Prevention (traffic education, awareness, repression)			

Code of the group: 5S-BP-DOS-V1-23/24-D
Name of the group: 5th Sem. Bachelor Full-Time TET-DOS 1st alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
612DOSI	**Traffic Surveys and Simulations** *Petr Kumpošt, Petr Richter Petr Kumpošt (Gar.)*	Z,ZK	3	1P+2C	Z	z
618DYKS	**Dynamics of Structures and Systems** *Ondřej Jiroušek Stanislav Hračov (Gar.)*	Z,ZK	3	2P+1C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5S-BP-DOS-V1-23/24-D Name=5th Sem. Bachelor Full-Time TET-DOS 1st alternative subject from 2023/24

612DOSI	Traffic Surveys and Simulations	Z,ZK	3

Ways of data collection in road transport. Traffic surveys. Automatic traffic counting. Preparation and implementation of traffic survey. Description of individual approaches focused on practical examples from real measurements. Methods of data processing and evaluation. Principles of simulation, SW environment for creating traffic models. Traffic model design procedure, calibration. Processing of a simple transport model based on real data.

618DYKS	Dynamics of Structures and Systems	Z,ZK	3

Vibration of systems with multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic constants, other numerical methods. Systems with continuously distributed mass. Matrix form of equations of vibration. Finite element method in dynamics of structures. Solving vibrations by superposition of natural modes. Subspace iteration methods. Introduction to nonlinear vibrations.

Code of the group: 5S-BP-DOS-V2-23/24-D
Name of the group: 5th Sem. Bachelor Full-Time TET-DOS 2nd alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 5 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 5
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
612MKOD	**City Rail Transport** *Ondřej Trešl*	Z,ZK	5	2P+1C	Z	z
616DYJV	**Vehicle Dynamics** *Josef Mík, Josef Svoboda, Přemysl Toman Josef Mík (Gar.)*	Z,ZK	5	2P+1C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5S-BP-DOS-V2-23/24-D Name=5th Sem. Bachelor Full-Time TET-DOS 2nd alternative subject from 2023/24

612MKOD	City Rail Transport	Z,ZK	5

City and suburban rail transport. Tram lines layout and city roads. Tram track geometry parameters. Tram track superstructure. Turnouts and other construction of tram lines. Tram stops and turn space. Underground and its basic characteristics. Underground nets in the world and undeground history in Prague. Underground track geometry parameters. Underground track superstructure and substructure. Underground stations. Suburban rail transport.

616DYJV	Vehicle Dynamics	Z,ZK	5

Application of mechanics. Wheel and axle suspension mechanism. Wheel to road positioning characteristics. Wheel - road contact. Skid and its characteristics. Longitudinal dynamics, acceleration and deceleration. Vertical dynamics, spring suspension, driving characteristics. Directional dynamics, gyroscopical characteristics. Driving stability conditions. Aerodynamic forces. Driving and feedback. ABS, ESP.

Code of the group: 5S-BP-DOS-V3-23/24-D
Name of the group: 5th Sem. Bachelor Full-Time TET-DOS 3rd alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
612POSD	**Assessment of Transport Structures** *Tomáš Javořík, Kristýna Neubergová Kristýna Neubergová (Gar.)*	KZ	3	2P+0C	Z	z

618NUMM	**Numerical Methods in Mechanics** *Ondřej Jiroušek Ondřej Jiroušek (Gar.)*	KZ	3	2P+0C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5S-BP-DOS-V3-23/24-D Name=5th Sem. Bachelor Full-Time TET-DOS 3rd alternative subject from 2023/24

612POSD	Assessment of Transport Structures	KZ	3

EIA process - historical context, impact and variants, analysis of individual phases of EIA process, SEA, legislative framework in the Czech Republic, EU directives, implementation of EU directives, public participation, process in practice. Methods of assessing the effects of transport structures on the environment. SWOT analysis. Multicriteria methods for assessment of transport structures, TUKP method. Risk analysis. Landscape.

618NUMM	Numerical Methods in Mechanics	KZ	3

Basics of the most used numerical methods in structural mechanics. Central difference method, finite element method, boundary element method. Time and spatial discretization schemes. Finite element method - derivation of the basic equations. Stiffness matrix, mass matrix, damping matrix at element level and structural level. Methods for solving systems of algebraic equations. Numerical integration.

Code of the group: 6S-BP-DOS-23/24-DC
Name of the group: 6th Sem. Bachelor Full-Time TET-DOS from 2023/24
Requirement credits in the group: In this group you have to gain 14 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 14
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
612PRMK	**Urban Road Traffic and Design** *Josef Kocourek, Tomáš Padělek Josef Kocourek (Gar.)*	Z,ZK	5	2P+2C	L	z
612VHD	**Public Transport** *Jan Kruntorád*	Z,ZK	5	3P+2C	L	z
622METD	**Measurement Methods and Technology in Transportation** *Drahomír Schmidt, Michal Frydrýn, Luboš Nouzovský, Zdeněk Svatý **Luboš Nouzovský** Drahomír Schmidt (Gar.)*	ZK	4	2P+2C	L	z

Characteristics of the courses of this group of Study Plan: Code=6S-BP-DOS-23/24-DC Name=6th Sem. Bachelor Full-Time TET-DOS from 2023/24

612PRMK	Urban Road Traffic and Design	Z,ZK	5

Composition of urban road, elements and routes for traffic, pedestrian and cycling transport, projection of intersections, traffic lights and its traffic safety proposal, roundabouts, calming of traffic, precaution for blind & partially-sighted, parking, traffic area, induction of traffic, organization and regulation of transport.

612VHD	Public Transport	Z,ZK	5

Importance of public transport, transport research, evaluation, planning of lines routes and territory operation, planning of operation parameters, preparation of operation, network conceptions, operation-technology and operation-economically conditions of planning of operation conceptions, planning of operation conception, planing and realisation of timetables, prepare of infrastrukture (route, stops), preference of public transport, financing.

622METD	Measurement Methods and Technology in Transportation	ZK	4

Measurement methods in transport, their meaning and use. Geodetic basics in Czechia. Angular, length and height measurements. Principles of mapping, accuracy and errors of geodetic measurements. Surveying and setting out. Challenges of localization, navigation and Global Navigation Satellite Systems. Laser scanning (terrestrial, mobile, UAV). Technical photography and photogrammetry. Dynamic measurements of vehicles. High-speed cameras.

Code of the group: 6S-BP-DOS-V1-23/24-D
Name of the group: 6th Sem. Bachelor Full-Time TET-DOS 1st alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 4 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 4
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
616PAV	**Passive Safety** *Zuzana Radová Josef Mík (Gar.)*	Z,ZK	4	2P+1C	L	z
617FID	**Financing and investment in transport** *Alexandra Dvořáčková Olga Mertlová (Gar.)*	Z,ZK	4	2P+1C+12B	L	z

Characteristics of the courses of this group of Study Plan: Code=6S-BP-DOS-V1-23/24-D Name=6th Sem. Bachelor Full-Time TET-DOS 1st alternative subject from 2023/24

616PAV	Passive Safety	Z,ZK	4

Road accident evaluation. Testing and legislation. Crash tests. Carbody properties. Injury mechanics. Restrain systems. Airbags. Road user safety. Mathematic modelling. Post collision safety systems.

617FID	Financing and investment in transport	Z,ZK	4

Sources of financing of transport infrastructure, the role of public administration in the financing and realization of investment in transport, the investment project project cycle, subsidy programs and their rules, competition, effectiveness and efficiency of spending public funds, evaluation systems of public projects and programs.

Code of the group: 6S-BP-DOS-V2-23/24-D
Name of the group: 6th Sem. Bachelor Full-Time TET-DOS 2nd alternative subject from 2023/24
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
612ZAR	**Introduction to Architectural Design** *Petr Červenka, Jana Kumpoštová*	Z	3	2P+0C+8B	L	Z
614ZDA	**Data Processing** *Ondřej Smíšek*	Z	3	0P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=6S-BP-DOS-V2-23/24-D Name=6th Sem. Bachelor Full-Time TET-DOS 2nd alternative subject from 2023/24

612ZAR	Introduction to Architectural Design	Z	3
Urbanism and architecture of traffic systems. Bus and trolley-bus transport. Tramway and town tracks. Design of vehicles. Subway. Railway transport. Railway stations. Local communications. International airports.			
614ZDA	Data Processing	Z	3
Introduction to data processing and analysis tools. Practical part of the training - introduction to the working environment, applied examples of data processing from practice, advanced methods of presentation of the results. Seminar papers on open data. Consultation hours for seminar papers. Seminar paper submission and presentation.			

Name of the block: Semestrální projekt
Minimal number of credits of the block: 8
The role of the block: ZP

Code of the group: XB-BP-DOS-22/23-DC
Name of the group: Research Groups Bachelor Full-Time TET-DOS from 2022/23
Requirement credits in the group: In this group you have to gain 8 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 8
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
622X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
623X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
612X31D	**Project 1 DOS** *Dagmar Kočárková*	Z	2	0P+2C	L	ZP
614X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
615X31D	**Project 1 DOS** *Petr Musil*	Z	2	0P+2C	L	ZP
621X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
616X31D	**Project 1 DOS** *Martin Scháno*	Z	2	0P+2C	L	ZP
617X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
618X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
620X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
611X31D	**Project 1 DOS**	Z	2	0P+2C	L	ZP
614X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP
612X32D	**Project 2 DOS** *Josef Kocourek, Tomáš Padělek, Petr Kumpošt, Dagmar Kočárková*	Z	2	0P+3C	Z	ZP
623X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP
622X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP
621X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP
620X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP
618X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP

617X32D	**Project 21 DOS**	Z	2	0P+3C	Z	ZP
616X32D	**Project 2 DOS** *Josef Mík, Martin Scháno Josef Mík (Gar.)*	Z	2	0P+3C	Z	ZP
615X32D	**Project 2 DOS** *Petr Musil*	Z	2	0P+3C	Z	ZP
611X32D	**Project 2 DOS**	Z	2	0P+3C	Z	ZP
611X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
622X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
621X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
620X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
618X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
623X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
616X33D	**Project 3 DOS** *Josef Mík, Martin Scháno Josef Mík (Gar.)*	Z	4	0P+4C	L	ZP
615X33D	**Project 3 DOS** *Petr Musil*	Z	4	0P+4C	L	ZP
614X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP
612X33D	**Project 3 DOS** *Josef Kocourek, Tomáš Padělek, Dagmar Kočárková*	Z	4	0P+4C	L	ZP
617X33D	**Project 3 DOS**	Z	4	0P+4C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=XB-BP-DOS-22/23-DC Name=Research Groups Bachelor Full-Time TET-DOS from 2022/23

622X31D	Project 1 DOS	Z	2
623X31D	Project 1 DOS	Z	2
612X31D	Project 1 DOS	Z	2
614X31D	Project 1 DOS	Z	2
615X31D	Project 1 DOS	Z	2
621X31D	Project 1 DOS	Z	2
616X31D	Project 1 DOS	Z	2
617X31D	Project 1 DOS	Z	2
618X31D	Project 1 DOS	Z	2
620X31D	Project 1 DOS	Z	2
611X31D	Project 1 DOS	Z	2
614X32D	Project 2 DOS	Z	2
612X32D	Project 2 DOS	Z	2
623X32D	Project 2 DOS	Z	2
622X32D	Project 2 DOS	Z	2
621X32D	Project 2 DOS	Z	2
620X32D	Project 2 DOS	Z	2
618X32D	Project 2 DOS	Z	2
617X32D	Project 21 DOS	Z	2
616X32D	Project 2 DOS	Z	2
615X32D	Project 2 DOS	Z	2
611X32D	Project 2 DOS	Z	2
611X33D	Project 3 DOS	Z	4
622X33D	Project 3 DOS	Z	4
621X33D	Project 3 DOS	Z	4
620X33D	Project 3 DOS	Z	4
618X33D	Project 3 DOS	Z	4
623X33D	Project 3 DOS	Z	4
616X33D	Project 3 DOS	Z	4
615X33D	Project 3 DOS	Z	4
614X33D	Project 3 DOS	Z	4
612X33D	Project 3 DOS	Z	4
617X33D	Project 3 DOS	Z	4

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

Code of the group: Y1-BP-DOS-23/24-DC
Name of the group: Comp. Sel. Courses Bachelor Full-Time TET-DOS from 2023/24

Requirement credits in the group: In this group you have to gain 8 credits
Requirement courses in the group: In this group you have to complete 4 courses
Credits in the group: 8
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
621Y1AM	**Aeronautical Information Management (AIM)**	KZ	2	2P+0C	Z	PV
620Y1AF	**Alternative Forms of Transportation Project Financing**	KZ	2	2P+0C	Z	PV
618Y1AM	**Anatomy, Mobility and Safety of Man**	KZ	2	2P+0C	Z	PV
614Y1AV	**Animation and Visualization**	KZ	2	2P+0C	L	PV
612Y1AE	**Applied Ecology**	KZ	2	2P+0C	Z	PV
620Y1AE	**Applied Electronics**	KZ	2	2P+0C	Z	PV
614Y1BE	**Barrierless Transport**	KZ	2	2P+0C	L	PV
615Y1BO	**Work Safety and Health Protection in Transportation**	KZ	2	2P+0C	L	PV
611Y1BK	**Error Detection Codes for Interlocking Systems**	KZ	2	2P+0C	Z	PV
621Y1BS	**Unmanned aircraft systems 1**	KZ	2	2P+0C	L	PV
614Y1BM	**Biometric Methods**	KZ	2	2P+0C	Z	PV
615Y1DZ	**History of Railway** *Martin Jacura Martin Jacura (Gar.)*	KZ	2	2P+0C	L	PV
612Y1DS	**Project Documentation in Practice**	KZ	2	2P+0C	Z	PV
617Y1EV	**Public Sector Economy**	KZ	2	2P+0C	Z	PV
623Y1EH	**Electronics and hardware in security of transportation**	KZ	2	2P+0C	L	PV
620Y1EK	**Qualification in Electrical Engineering**	KZ	2	2P+0C	L	PV
616Y1EN	**Energy Requirements of Vehicles**	KZ	2	2P+0C	L	PV
620Y1EA	**Environmental Aspects of Transport**	KZ	2	2P+0C	Z	PV
615Y1EH	**European Integration within Historical Context**	KZ	2	2P+0C	Z	PV
618Y1EM	**Experimental Methods in Mechanics**	KZ	2	2P+0C	Z	PV
615Y1FD	**French Area Studies and Transportation**	KZ	2	2P+0C	L	PV
614Y1HW	**Computer Hardware**	KZ	2	2P+0C	L	PV
615Y1HL	**History of Civil Aviation**	KZ	2	2P+0C	L	PV
615Y1HD	**History of City Mass Transport**	KZ	2	2P+0C	Z	PV
612Y1HD	**Traffic Noise**	KZ	2	2P+0C	L	PV
615Y1HE	**Work Hygiene and Ergonomics in Traffic**	KZ	2	2P+0C	Z	PV
616Y1IS	**Interactive simulators and simulations** *Libor Žídek, Ondřej Smíšek, Martin Scháno, Ondřej Piksa, Jiří Zeisek*	KZ	2	2P+0C	L	PV
612Y1KN	**Combined Transportation**	KZ	2	2P+0C	Z	PV
612Y1KP	**Communication and Promotion of Transport Projects**	KZ	2	2P+0C	L	PV
620Y1KP	**Communication and presentation skills**	KZ	2	2P+0C	Z	PV
623Y1KM	**Crisis Management**	KZ	2	2P+0C	Z	PV
623Y1KO	**Quantum Physics and Optoelectronics**	KZ	2	2P+0C	L	PV
623Y1KY	**Cybernality**	KZ	2	2P+0C	L	PV
623Y1KB	**Cyber security in transportation**	KZ	2	2P+0C	L	PV
621Y1LJ	**Aeronautical Radio and Flight Instruments**	KZ	2	2P+0C	L	PV
621Y1LS	**Air Traffic Services**	KZ	2	2P+0C	L	PV
617Y1LL	**Logistics of Passenger and Freight Air Transport**	KZ	2	2P+0C	L	PV
620Y1LN	**Location and Navigation**	KZ	2	2P+0C	L	PV
623Y1MK	**Crisis Situation Management in Critical Infrastructure**	KZ	2	2P+0C	L	PV
623Y1MU	**Emergency Events Management Solution in Transport Infrastructure**	KZ	2	2P+0C	Z	PV
617Y1MD	**Marketing in Transportation** *Alexandra Dvořáčková*	KZ	2	2P+0C	Z	PV
618Y1MT	**Engineering Materials**	KZ	2	2P+0C	L	PV
621Y1MP	**Matlab for project-oriented study**	KZ	2	2P+0C	Z	PV

614Y1MP	**Modeling Complex Assemblies and Models in Parametric Modeller**	KZ	2	2P+0C	Z	PV
615Y1MK	**Modern History in Context: Every Day Life and Transport**	KZ	2	2P+0C	L	PV
615Y1NE	**German in the Economy and Society**	KZ	2	2P+0C	Z	PV
621Y1OH	**Airline Business and Operations**	KZ	2	2P+0C	Z	PV
623Y1OK	**Protection of Critical Objects and Infrastructures**	KZ	2	2P+0C	L	PV
620Y1OI	**Fare Collection and Information Systems**	KZ	2	2P+0C	L	PV
614Y1OJ	**Object - oriented programming in JAVA**	KZ	2	2P+0C	L	PV
614Y1OP	**Operating System**	KZ	2	2P+0C	Z	PV
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
621Y1PC	**ATC Procedures and Activities**	KZ	2	2P+0C	Z	PV
612Y1PD	**Assessment of Transport**	KZ	2	2P+0C	Z	PV
620Y1PK	**Product Quality Management Processes**	KZ	2	2P+0C	Z	PV
614Y1PJ	**C Programming Language**	KZ	2	2P+0C	Z	PV
612Y1C1	**Designing Roads in Civil 3D I**	KZ	2	2P+0C	L	PV
612Y1C2	**Designing Roads in Civil 3D II**	KZ	2	2P+0C	Z	PV
614Y1PA	**3D Modeling in AutoCAD**	KZ	2	2P+0C	Z	PV
616Y1PV	**Operation, Construction and Maintenance of Vehicles**	KZ	2	2P+0C	L	PV
612Y1PU	**Organization Disposition of Railway Stations**	KZ	2	2P+0C	L	PV
612Y1RU	**Railway Lines Reconstruction**	KZ	2	2P+0C	Z	PV
616Y1RE	**Control and Electronic Vehicle Systems** *Josef Mík, Přemysl Toman, Martin Scháno Přemysl Toman (Gar.)*	KZ	2	2P+0C	Z	PV
621Y1RZ	**Human Resources Management**	KZ	2	2P+0C	L	PV
617Y1ST	**Titan Simulation**	KZ	2	2P+0C	L	PV
621Y1SI	**ATC Simulator**	KZ	2	2P+0C	L	PV
620Y1SC	**Sensors and Actuators**	KZ	2	2P+0C	L	PV
617Y1SL	**Sociology of Human Resources**	KZ	2	2P+0C	Z	PV
611Y1SI	**Transportation Software Engineering**	KZ	2	2P+0C	Z	PV
616Y1KS	**Quality and Reliability of Vehicles**	KZ	2	2P+0C	Z	PV
612Y1SU	**Management and Maintenance of Roads**	KZ	2	2P+0C	L	PV
616Y1SO	**Strategy and innovation in mobility**	KZ	2	2P+0C	Z	PV
617Y1SK	**Urban and Regional Rail Transport Systems**	KZ	2	2P+0C	L	PV
611Y1TG	**Graph Theory**	KZ	2	2P+0C	L	PV
623Y1TP	**Criminal Law in IT and Transportation**	KZ	2	2P+0C	Z	PV
614Y1TI	**Creating Interactive Internet Applications**	KZ	2	2P+0C	L	PV
621Y1UL	**Aircraft Maintenance**	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
612Y1VR	**Public Transport in Cities and Regions**	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
614Y1WG	**Webdesign**	KZ	2	2P+0C	Z	PV
614Y1W1	**Webdesign 1**	KZ	2	2P+0C	Z	PV

614Y1W2	**Webdesign 2**	KZ	2	2P+0C	L	PV
616Y1ZG	**Introduction into Applied Computer Graphics**	KZ	2	2P+0C	L	PV
614Y1ZM	**Fundamentals of parametric and adaptive modeling**	KZ	2	2P+0C	L	PV
611Y1ZM	**Foundation of MATLAB Programming**	KZ	2	2P+0C	L	PV
614Y1ZJ	**Fundamentals of programming in JAVA**	KZ	2	2P+0C	Z	PV
612Y1ZU	**Principles of Urbanism**	KZ	2	2P+0C	Z	PV
615Y1ZV	**East-West dichotomy: Prelude to the Cold War**	KZ	2	2P+0C	Z	PV
616Y1ZL	**Vehicle Testing, Legislation and Construction**	KZ	2	2P+0C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=Y1-BP-DOS-23/24-DC Name=Comp. Sel. Courses Bachelor Full-Time TET-DOS from 2023/24

621Y1AM	Aeronautical Information Management (AIM)	KZ	2

Definition and basic overview of AIS and AIM. Transition from AIS to AIM. Regulatory base. Provision of AIS/AIM in the Czech Rep. AIP (Aeronautical Inf. Publication). VFR Manual of the Czech Rep. AIRAC System. NOTAM messages.PIB (Pre-flight Informtion Bulletin). AIC (Aeoronautical Inf. Circulars). Aeronautical Charts. EAD (Europena AIS Database). QMS (Quality Mng. System). ADQ (Aeronautical Data Quality). AIXM (Aeronautical Inf. Exchnage Format).

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.

612Y1AE	Applied Ecology	KZ	2

General ecology - ecological concepts and principles, ecosystem, ecological factors, energy flow through the ecosystem. Application of knowledge within EIA documentation. Special ecology. Landscape ecology - origin and historical development. Landscape definition and classification. Success. Traffic constructions in the countryside. Landscape and nature protection. Applied ecology.

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.

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.

611Y1BK	Error Detection Codes for Interlocking Systems	KZ	2

Safe communication and methods for its assuring. Safety codes linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channels, detection of transmission errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 50159.

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.

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.

617Y1EV	Public Sector Economy	KZ	2

Economic and financial theory of public sector, public choice theory, externalites, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.

623Y1EH	Electronics and hardware in security of transportation	KZ	2

Types and parameters of signals. Passive circuits, properties, basic measurements. Passive filters, semiconductors. Operational amplifiers, basic circuits, parameters. Active filters. Power supplies. Logic circuits. AD converters. Connection of analog and digital parts. Basic blocks of digital signal processing. Measurement processing. Design and fabrication methods in electronics.

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.			
612Y1KP	Communication and Promotion of Transport Projects	KZ	2
Fundamentals of Public Relations and the power of public opinion. Work and tasks of PR department and press spokesperson. Communication with the media, the public on social networks and beyond. Communication strategy of transport projects. Systematic goodwill building. Crisis situations in communication and preparation for crisis communication. The influence of political marketing and political PR on transport projects. Lobbing.			
620Y1KP	Communication and presentation skills	KZ	2
Motivation, priorities and their fulfillment, current communication networks, work with various sources, formal requirements of emails and final theses, basic typology of personalities, teamwork, emotional intelligence, manipulation and way of working with it, coping with stressful situations, formal requirements of presentations, ways of communication during presentation, presentation skills, presentation skills in online environment.			
623Y1KM	Crisis Management	KZ	2
Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on: theory and position of crisis management and its targets; IZS-crisis management-crisis planning; and basic legislation. Practical part is concentrated to responsibility matrix compilation.			
623Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
623Y1KY	Cybernality	KZ	2
Juridical aspects of behavior on the computer network and computer systems. Cybernetic crime technology. Theory basis and models. Cyberterrorism. Infoware and connected aspects.			
623Y1KB	Cyber security in transportation	KZ	2
Basic concepts of security and cyber security, legal status in the field of cyber security, virtual cyberspace and communities, taxonomy of crimes in cyberspace, social impacts, social engineering, cyber attack technology, information security, cyber attacks on telematics systems, security of systems with artificial intelligence, norms and standards.			
621Y1LJ	Aeronautical Radio and Flight Instruments	KZ	2
Basic definitions, history of aircraft instrumentation, aerometric instrumentation, Earth magnetism, aircraft electric equipment, gyroscopic instrumentation, airframe instrumentation and other aircraft equipment, engine instrumentation, warning and recording systems, instrumentation operational requirements, radiocommunication and radionavigation.			
621Y1LS	Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP a ACC control. History of ATS at USA and Czechoslovakia. ATS - Model of financing. Training System of Air Traffic Controllers. Future development of ATS.			
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.			

623Y1MK	Crisis Situation Management in Critical Infrastructure	KZ	2
Determination of critical infrastructute elements on all levels, their protection systems, responsibilities of particular agencies of the state administration and the self-government, and their responsibilities to anounce particular safety provisions. Physical and cyber protection of critical infrastructure with special attention to the soft targets.			
623Y1MU	Emergency Events Management Solution in Transport Infrastructure	KZ	2
Basic solutions of emergency events with emphasis of the transport infrastructure events and their solution management. Knowledge in the emergency planning and special procedures in liquidation work within the transport infrastructure.			
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.			
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.			
621Y1OH	Airline Business and Operations	KZ	2
The course provides a comprehensive view of the commercial, operational and transportation activities of air transport companies. It focuses on the organizational structure of companies, various aspects of their strategy, economic and operational indicators. It introduces students in detail to operational processes and the essentials of transportation processes. It provides a basic view of the economic aspects of air transport.			
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.			
621Y1PC	ATC Procedures and Activities	KZ	2
Air traffic control procedures, basics of communication and phraseology, aircraft identification, spacing and traffic coordination. In addition, the course discusses air traffic control at the airports and low visibility operational procedures. Students will during the course learn basic safety management applications applied across the infrastructure.			
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.			
612Y1RU	Railway Lines Reconstruction	KZ	2
Keeping railway line operational, maintaining lines and stations, geometrical alignment of railway line, vehicles for railway superstructure and substructure maintenance, scheduling and organising possesions, preparation of railway lines reconstruction and maintenance, process of ralway line reconstruction.			
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.			
621Y1SI	ATC Simulator	KZ	2
Familiarization with the simulation environment, acquiring basic habits, aircraft identification procedures, vectoring, level changes, ATC clearance, use of RNAV points. Practical exercises focusing on basic vectoring, early application of vertical separation, EST and REV message passing. Practical exercises in the APPROACH area, practicing arrival and departure management procedures, conflict resolution.			
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.			
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.			

616Y1SO	Strategy and innovation in mobility	KZ	2
Introduction to innovation, definition. Innovation strategy. Innovation life cycle and ecosystem, main sources and funding opportunities. Successful innovation project, KPIs, budget; co-financing, evaluation. Sprint method and its use. Innovative business model - main patterns and examples, design, strategy, processes and outlook (business plan and possibilities of use). Creating an innovation strategy. Customer and value map, design and testing.			
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.			
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			
623Y1TP	Criminal Law in IT and Transportation	KZ	2
Introduction of criminal law into legal order, conception of culpability and criminal delict, consequency of other legal standards. international treaty and criminal law, investigation of crime, specific indicia of criminal court cases, practical examples.			
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.			
621Y1UL	Aircraft Maintenance	KZ	2
Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and qualification of aviation personnel. Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance. Regulation of director EASA for aircraft maintenance. Seminars will be focused on practical application.			
614Y1UP	Editing of Theses in MS Word	KZ	2
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, 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.			
612Y1VR	Public Transport in Cities and Regions	KZ	2
Professional and political pillars of public transport. Accessibility of public transport. Transport demand management and directional coordination of lines. Principles of line tracing. Basic operating parameters and transport variations. Types of lines according to their routing and basic operating parameters. Time coordination of lines. Operational traffic control. Organization of tram operation in Prague. Tram safety.			
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.			
614Y1WG	Webdesign	KZ	2
Students will learn the basics of HTTP communication, URL and addressing, HTML5 markup language, advanced CSS3 techniques, accessible and usable web rules, responsive webdesign, content management systems, web server installation + configuration directives. The subject matter will be trained on examples.			
614Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web 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.			
614Y1ZJ	Fundamentals of programming in JAVA	KZ	2
Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Chain Conversion, Text Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods for field work, ASCII, Functions, parameters, return value, recursion, Program creation			
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.			

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

Code of the group: VP-BP-TET-20/21-DC
Name of the group: Bachelor Full-Time TET voluntary
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
614DPK	**Digital Support for Designing of Roads and Highways**	Z	0	0P+2C	Z	v
614DZT	**Digital Support for Railway Lines**	Z	0	0P+2C	L	v
611SCFZ	**Seminar of Physics**	Z	0	0P+2C	Z	v
621SLD	**Seminar of Air Transport**	Z	0	0P+2C	L	v
618SPP	**Seminary from Elasticity and Strength**	Z	0	0P+2C	Z	v
618STD	**Seminary from Technical Documentation**	Z	0	0P+2C	Z	v
618SS	**Seminary from Structural Analysis**	Z	0	0P+2C	L	v
611SSF	**Secondary School Physics Course**	Z	0	0P+2C	L	v
TVKLV	**Physical Education Course**	Z	0	7dní	L	v
TVKZV	**Physical Education Course**	Z	0	7dní	Z	v

Characteristics of the courses of this group of Study Plan: Code=VP-BP-TET-20/21-DC Name=Bachelor Full-Time TET voluntary

614DPK	Digital Support for Designing of Roads and Highways	Z	0
Seminars possibilities of technical processing problems focused on designing of roads and highways.			
614DZT	Digital Support for Railway Lines	Z	0
Seminars possibilities of technical processing problems solved in the field of railway lines.			
611SCFZ	Seminar of Physics	Z	0
Solving problems on kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
621SLD	Seminar of Air Transport	Z	0
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.			
618SPP	Seminary from Elasticity and Strength	Z	0
Excersise for practice. Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling.			
618STD	Seminary from Technical Documentation	Z	0
Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.			
618SS	Seminary from Structural Analysis	Z	0
Examples for practise. General system of forces. Reactions of mass objects and compound systems. Internal forces on statically determinate beam and simple framework. Application of principle of virtual works for calculation of reactions of staticaly determinate systems. Determination of axial forces in truss construction - method of joints and method of sections. Geometry of cross sections. Plane fiber polygons.			
611SSF	Secondary School Physics Course	Z	0
Basics of kinematics, dynamics, thermodynamics, electric field and magnetic field.			
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

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

Code of the group: JZ-BP-TET-22/23-DC
Name of the group: Bachelor TET Full-Time 2nd Language Courses from 2022/23
Requirement credits in the group: In this group you have to gain 6 credits
Requirement courses in the group: In this group you have to complete 2 courses
Credits in the group: 6
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
615JZ3F	**Foreign Language - French 3** *Irena Veselková Irena Veselková (Gar.)*	Z	3	0P+4C+10B	Z	J
615JZ3I	**Foreign Language - Italian 3**	Z	3	0P+4C+10B	Z	J
615JZ3N	**Foreign Language - German 3** *Eva Rezlerová*	Z	3	0P+4C+10B	Z	J
615JZ3R	**Foreign Language - Russian 3** *Marie Michlová*	Z	3	0P+4C+10B	Z	J
615JZ3S	**Foreign Language - Spanish 3**	Z	3	0P+4C+10B	Z	J
615JZ4F	**Foreign Language - French 4** *Irena Veselková Irena Veselková (Gar.)*	Z,ZK	3	0P+4C+10B	L	J
615JZ4I	**Foreign Language - Italian 4**	Z,ZK	3	0P+4C+10B	L	J
615JZ4N	**Foreign Language - German 4** *Eva Rezlerová, Světlana Petrová, René Skalický*	Z,ZK	3	0P+4C+10B	L	J
615JZ4R	**Foreign Language - Russian 4** *Marie Michlová, Vilma Gottwaldová*	Z,ZK	3	0P+4C+10B	L	J
615JZ4S	**Foreign Language - Spanish 4**	Z,ZK	3	0P+4C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-BP-TET-22/23-DC Name=Bachelor TET Full-Time 2nd Language Courses from 2022/23

615JZ3F	Foreign Language - French 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3I	Foreign Language - Italian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3N	Foreign Language - German 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3R	Foreign Language - Russian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3S	Foreign Language - Spanish 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4F	Foreign Language - French 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4I	Foreign Language - Italian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4N	Foreign Language - German 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
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. Indefinite integral, Newton integral, Riemann integral, improper Riemann integral. First-order differential equations, linear differential equations.			
611CAL2	Calculus 2	Z,ZK	5
Linear differential equations and their systems, differential calculus of functions of several real variables. Riemann integral in Rn. Line and surface integrals.			
611EMOP	Electromagnetic Field and Optics	Z,ZK	4
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			
611FYZ	Physics	Z,ZK	5
Kinematics, dynamics, Newton's laws, force fields, mechanics of continuum, thermodynamics, introduction to electrostatics and electric current.			
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.			
611MDSD	Collecting and Processing of Traffic Data	KZ	3
Basic principles of traffic detection and data collection, specific problems of the field of traffic data. Data preprocessing and analysis for use in additional applications.			
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.			
611SCFZ	Seminar of Physics	Z	0
Solving problems on kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
611SSF	Secondary School Physics Course	Z	0
Basics of kinematics, dynamics, thermodynamics, electric field and magnetic field.			
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.			
611X31D	Project 1 DOS	Z	2
611X32D	Project 2 DOS	Z	2
611X33D	Project 3 DOS	Z	4
611Y1BK	Error Detection Codes for Interlocking Systems	KZ	2
Safe communication and methods for its assuring. Safety codes linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channels, detection of transmission errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 50159.			
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.			
612DOSI	Traffic Surveys and Simulations	Z,ZK	3
Ways of data collection in road transport. Traffic surveys. Automatic traffic counting. Preparation and implementation of traffic survey. Description of individual approaches focused on practical examples from real measurements. Methods of data processing and evaluation. Principles of simulation, SW environment for creating traffic models. Traffic model design procedure, calibration. Processing of a simple transport model based on real data.			
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.			
612MKOD	City Rail Transport	Z,ZK	5
City and suburban rail transport. Tram lines layout and city roads. Tram track geometry parameters. Tram track superstructure. Turnouts and other construction of tram lines. Tram stops and turn space. Underground and its basic characteristics. Underground nets in the world and undeground history in Prague. Underground track geometry parameters. Underground track superstructure and substructure. Underground stations. Suburban rail transport.			

612POSD	Assessment of Transport Structures	KZ	3
EIA process - historical context, impact and variants, analysis of individual phases of EIA process, SEA, legislative framework in the Czech Republic, EU directives, implementation of EU directives, public participation, process in practice. Methods of assessing the effects of transport structures on the environment. SWOT analysis. Multicriteria methods for assessment of transport structures, TUKP method. Risk analysis. Landscape.			
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.			
612PRMK	Urban Road Traffic and Design	Z,ZK	5
Composition of urban road, elements and routes for traffic, pedestrian and cycling transport, projection of intersections, traffic lights and its traffic safety proposal, roundabouts, calming of traffic, precaution for blind & partially-sighted, parking, traffic area, induction of traffic, organization and regulation of transport.			
612PUSS	Organization Disposition of Railway Stations	KZ	3
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.			
612SDK	Highways, Motorways and Intersections	Z,ZK	4
Roads and motorways network, transport output. Types of direction curves. Hairpin bend. Stopping sight distance and overtaking sight distance. Levels of traffic service. Design elements of crossroads and intersections. Crossroads. Roundabouts. Intersections. Special types of junctions. Capacity of crossroads and intersections. Structure of pavement of roads and motorways. Road engineering structures. Assessment of route alternatives.			
612VHD	Public Transport	Z,ZK	5
Importance of public transport, transport research, evaluation, planning of lines routes and territory operation, planning of operation parameters, preparation of operation, network conceptions, operation-technology and operation-economically conditions of planning of operation conceptions, planning of operation conception, planing and realisation of timetables, prepare of infrastrukture (route, stops), preference of public transport, financing.			
612X31D	Project 1 DOS	Z	2
612X32D	Project 2 DOS	Z	2
612X33D	Project 3 DOS	Z	4
612Y1AE	Applied Ecology	KZ	2
General ecology - ecological concepts and principles, ecosystem, ecological factors, energy flow through the ecosystem. Application of knowledge within EIA documentation. Special ecology. Landscape ecology - origin and historical development. Landscape definition and classification. Success. Traffic constructions in the countryside. Landscape and nature protection. Applied ecology.			
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.			
612Y1KP	Communication and Promotion of Transport Projects	KZ	2
Fundamentals of Public Relations and the power of public opinion. Work and tasks of PR department and press spokesperson. Communication with the media, the public on social networks and beyond. Communication strategy of transport projects. Systematic goodwill building. Crisis situations in communication and preparation for crisis communication. The influence of political marketing and political PR on transport projects. Lobbing.			
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.			
612Y1RU	Railway Lines Reconstruction	KZ	2
Keeping railway line operational, maintaining lines and stations, geometrical alignment of railway line, vehicles for railway superstructure and substructure maintenance, scheduling and organising possesions, preparation of railway lines reconstruction and maintenance, process of ralway line reconstruction.			
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.			

612Y1VR	Public Transport in Cities and Regions	KZ	2
Professional and political pillars of public transport. Accessibility of public transport. Transport demand management and directional coordination of lines. Principles of line tracing. Basic operating parameters and transport variations. Types of lines according to their routing and basic operating parameters. Time coordination of lines. Operational traffic control. Organization of tram operation in Prague. Tram safety.			
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.			
612ZAR	Introduction to Architectural Design	Z	3
Urbanism and architecture of traffic systems. Bus and trolley-bus transport. Tramway and town tracks. Design of vehicles. Subway. Railway transport. Railway stations. Local communications. International airports.			
612ZELP	Railway Operation	Z,ZK	4
Legislation in railway transport. Railway vehicles. Railway signals and signal devices. Railway traffic organisation and operation. Simplified railway traffic operation. Railway vehicles brakes. Railway vehicles marking. Operation intervals. Theoretical graph of train running.			
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.			
614DPK	Digital Support for Designing of Roads and Highways	Z	0
Seminars possibilities of technical processing problems focused on designing of roads and highways.			
614DZT	Digital Support for Railway Lines	Z	0
Seminars possibilities of technical processing problems solved in the field of railway lines.			
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).			
614PODP	Computer Aid of Transportation Projecting	KZ	3
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.			
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.			
614X31D	Project 1 DOS	Z	2
614X32D	Project 2 DOS	Z	2
614X33D	Project 3 DOS	Z	4
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.			
614Y1WG	Webdesign	KZ	2
Students will learn the basics of HTTP communication, URL and addressing, HTML5 markup language, advanced CSS3 techniques, accessible and usable web rules, responsive webdesign, content management systems, web server installation + configuration directives. The subject matter will be trained on examples.			
614Y1ZJ	Fundamentals of programming in JAVA	KZ	2
Introduction to the Java SE Platform, IDE Installation and First Project, Comments, Variables and Type System, Operators, User Input and Parsing, Chain and Chain Conversion, Text Chain and Mathematical Methods, Terms, Relational Operators and Switches, Cycles for, while, foreach, Field - declaration, initialization, methods for field work, ASCII, Functions, parameters, return value, recursion, Program creation			
614Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
614ZDA	Data Processing	Z	3
Introduction to data processing and analysis tools. Practical part of the training - introduction to the working environment, applied examples of data processing from practice, advanced methods of presentation of the results. Seminar papers on open data. Consultation hours for seminar papers. Seminar paper submission and presentation.			
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.			
615JZ3F	Foreign Language - French 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3I	Foreign Language - Italian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3N	Foreign Language - German 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			

615JZ3R	Foreign Language - Russian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ3S	Foreign Language - Spanish 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4F	Foreign Language - French 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4I	Foreign Language - Italian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4N	Foreign Language - German 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
615X31D	Project 1 DOS	Z	2
615X32D	Project 2 DOS	Z	2
615X33D	Project 3 DOS	Z	4
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.			
616DOKY	Vehicle Technology	Z,ZK	5
Technical nomenclature in transportation technology. Vehicle in legislation. Design. Operation. Influence on environment. Vehicle and ecology. Traction engine characteristics - combustion engines, electric engines, change of energy principles. Powertrain construction. Power transmission. Brake systems.			

616DYJV	Vehicle Dynamics	Z,ZK	5
Application of mechanics. Wheel and axle suspension mechanism. Wheel to road positioning characteristics. Wheel - road contact. Skid and its characteristics. Longitudinal dynamics, acceleration and deceleration. Vertical dynamics, spring suspension, driving characteristics. Directional dynamics, gyroscopical characteristics. Driving stability conditions. Aerodynamic forces. Driving and feedback. ABS, ESP.			
616PAV	Passive Safety	Z,ZK	4
Road accident evaluation. Testing and legislation. Crash tests. Carbody properties. Injury mechanics. Restrain systems. Airbags. Road user safety. Mathematic modelling. Post collision safety systems.			
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.			
616X31D	Project 1 DOS	Z	2
616X32D	Project 2 DOS	Z	2
616X33D	Project 3 DOS	Z	4
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.			
616Y1SO	Strategy and innovation in mobility	KZ	2
Introduction to innovation, definition. Innovation strategy. Innovation life cycle and ecosystem, main sources and funding opportunities. Successful innovation project, KPIs, budget; co-financing, evaluation. Sprint method and its use. Innovative business model - main patterns and examples, design, strategy, processes and outlook (business plan and possibilities of use). Creating an innovation strategy. Customer and value map, design and testing.			
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.			
617FID	Financing and investment in transport	Z,ZK	4
Sources of financing of transport infrastructure, the role of public administration in the financing and realization of investment in transport, the investment project project cycle, subsidy programs and their rules, competition, effectiveness and efficiency of spending public funds, evaluation systems of public projects and programs.			
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.			
617X31D	Project 1 DOS	Z	2
617X32D	Project 21 DOS	Z	2
617X33D	Project 3 DOS	Z	4
617Y1EV	Public Sector Economy	KZ	2
Economic and financial theory of public sector, public choice theory, externalites, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
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.			
618DYKS	Dynamics of Structures and Systems	Z,ZK	3
Vibration of systems with multiple degrees of freedom. Natural modes and natural frequencies. Method of stiffness constants, method of elastic constants, other numerical methods. Systems with continuously distributed mass. Matrix form of equations of vibration. Finite element method in dynamics of structures. Solving vibrations by superposition of natural modes. Subspace iteration methods. Introduction to nonlinear vibrations.			
618KIDY	Kinematics and Dynamics	Z,ZK	4
Friction. Motion along a line and a curve. Kinematics of rigid body. Kinematics of the point mass and the system of mass points. Dynamics of a mass point and a system of mass points, equation of motion. Method of Newton. D'Alembert principle. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with two degrees of freedom.			
618MECK	Mechanics of Constructions	KZ	3
Energetic solution of elastic beam. Solution of statically indeterminate systems - force and deformation method. Stiffness and compliance matrix of a system. Finite difference method. History and fundamentals of structural design. Characteristics of steel, design of steel structures. Introduction to mathematical theory of elasticity in 3D.			
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.			
618NUMM	Numerical Methods in Mechanics	KZ	3
Basics of the most used numerical methods in structural mechanics. Central difference method, finite element method, boundary element method. Time and spatial discretization schemes. Finite element method - derivation of the basic equations. Stiffness matrix, mass matrix, damping matrix at element level and structural level. Methods for solving systems of algebraic equations. Numerical integration.			
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.			
618SPP	Seminary from Elasticity and Strength	Z	0
Excersise for practice. Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling.			
618SS	Seminary from Structural Analysis	Z	0
Examples for practise. General system of forces. Reactions of mass objects and compound systems. Internal forces on statically determinate beam and simple framework. Application of principle of virtual works for calculation of reactions of staticaly determinate systems. Determination of axial forces in truss construction - method of joints and method of sections. Geometry of cross sections. Plane fiber polygons.			
618STD	Seminary from Technical Documentation	Z	0
Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.			
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.			
618X31D	Project 1 DOS	Z	2
618X32D	Project 2 DOS	Z	2
618X33D	Project 3 DOS	Z	4
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.			
620X31D	Project 1 DOS	Z	2
620X32D	Project 2 DOS	Z	2
620X33D	Project 3 DOS	Z	4
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.			
620Y1KP	Communication and presentation skills	KZ	2
Motivation, priorities and their fulfillment, current communication networks, work with various sources, formal requirements of emails and final theses, basic typology of personalities, teamwork, emotional intelligence, manipulation and way of working with it, coping with stressful situations, formal requirements of presentations, ways of communication during presentation, presentation skills, presentation skills in online environment.			
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.			
621SLD	Seminar of Air Transport	Z	0
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.			
621X31D	Project 1 DOS	Z	2
621X32D	Project 2 DOS	Z	2
621X33D	Project 3 DOS	Z	4
621Y1AM	Aeronautical Information Management (AIM)	KZ	2
Definition and basic overview of AIS and AIM. Transition from AIS to AIM. Regulatory base. Provision of AIS/AIM in the Czech Rep. AIP (Aeronautical Inf. Publication). VFR Manual of the Czech Rep. AIRAC System. NOTAM messages.PIB (Pre-flight Informtion Bulletin). AIC (Aeoronautical Inf. Circulars). Aeronautical Charts. EAD (Europena AIS Database). QMS (Quality Mng. System). ADQ (Aeronautical Data Quality). AIXM (Aeronautical Inf. Exchnage Format).			
621Y1BS	Unmanned aircraft systems 1	KZ	2
Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.			
621Y1LJ	Aeronautical Radio and Flight Instruments	KZ	2
Basic definitions, history of aircraft instrumentation, aerometric instrumentation, Earth magnetism, aircraft electric equipment, gyroscopic instrumentation, airframe instrumentation and other aircraft equipment, engine instrumentation, warning and recording systems, instrumentation operational requirements, radiocommunication and radionavigation.			
621Y1LS	Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP a ACC control. History of ATS at USA and Czechoslovakia. ATS - Model of financing. Training System of Air Traffic Controllers. Future development of ATS.			

621Y1MP	Matlab for project-oriented study	KZ	2
The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises 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.			
621Y1OH	Airline Business and Operations	KZ	2
The course provides a comprehensive view of the commercial, operational and transportation activities of air transport companies. It focuses on the organizational structure of companies, various aspects of their strategy, economic and operational indicators. It introduces students in detail to operational processes and the essentials of transportation processes. It provides a basic view of the economic aspects of air transport.			
621Y1PC	ATC Procedures and Activities	KZ	2
Air traffic control procedures, basics of communication and phraseology, aircraft identification, spacing and traffic coordination. In addition, the course discusses air traffic control at the airports and low visibility operational procedures. Students will during the course learn basic safety management applications applied across the infrastructure.			
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.			
621Y1SI	ATC Simulator	KZ	2
Familiarization with the simulation environment, acquiring basic habits, aircraft identification procedures, vectoring, level changes, ATC clearance, use of RNAV points. Practical exercises focusing on basic vectoring, early application of vertical separation, EST and REV message passing. Practical exercises in the APPROACH area, practicing arrival and departure management procedures, conflict resolution.			
621Y1UL	Aircraft Maintenance	KZ	2
Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and qualification of aviation personnel. Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance. Regulation of director EASA for aircraft maintenance. Seminars will be focused on practical application.			
621ZALD	Basics of Air Transport	KZ	2
History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. 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.			
622DON	Traffic Accidents	Z,ZK	6
Introduction to Road Accidents and Forensic Expertise; Rail, Water and Air Accidents; Road Accident Documentation and Documentation Technology; Accident Data Recorders - EDR Systems; Road Accident Trace Analysis and Fake Accidents; Simulation Programmes for Road Accident Analysis; Pedestrian and Cyclist Accidents; Vehicle technologies and systems and autonomous vehicles; Safe road layout and collision diagrams; Not giving right of way; Technical defects of vehicles; Restraints - passive road safety; Accidents at level crossings; Prevention (traffic education, awareness, repression)			
622METD	Measurement Methods and Technology in Transportation	ZK	4
Measurement methods in transport, their meaning and use. Geodetic basics in Czechia. Angular, length and height measurements. Principles of mapping, accuracy and errors of geodetic measurements. Surveying and setting out. Challenges of localization, navigation and Global Navigation Satellite Systems. Laser scanning (terrestrial, mobile, UAV). Technical photography and photogrammetry. Dynamic measurements of vehicles. High-speed cameras.			
622X31D	Project 1 DOS	Z	2
622X32D	Project 2 DOS	Z	2
622X33D	Project 3 DOS	Z	4
623X31D	Project 1 DOS	Z	2
623X32D	Project 2 DOS	Z	2
623X33D	Project 3 DOS	Z	4
623Y1EH	Electronics and hardware in security of transportation	KZ	2
Types and parameters of signals. Passive circuits, properties, basic measurements. Passive filters, semiconductors. Operational amplifiers, basic circuits, parameters. Active filters. Power supplies. Logic circuits. AD converters. Connection of analog and digital parts. Basic blocks of digital signal processing. Measurement processing. Design and fabrication methods in electronics.			
623Y1KB	Cyber security in transportation	KZ	2
Basic concepts of security and cyber security, legal status in the field of cyber security, virtual cyberspace and communities, taxonomy of crimes in cyberspace, social impacts, social engineering, cyber attack technology, information security, cyber attacks on telematics systems, security of systems with artificial intelligence, norms and standards.			
623Y1KM	Crisis Management	KZ	2
Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on: theory and position of crisis management and its targets; IZS-crisis management-crisis planning; and basic legislation. Practical part is concentrated to responsibility matrix compilation.			
623Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
623Y1KY	Cybernality	KZ	2
Juridical aspects of behavior on the computer network and computer systems. Cybernetic crime technology. Theory basis and models. Cyberterrorism. Infoware and connected aspects.			
623Y1MK	Crisis Situation Management in Critical Infrastructure	KZ	2
Determination of critical infrastructute elements on all levels, their protection systems, responsibilities of particular agencies of the state administration and the self-government, and their responsibilities to anounce particular safety provisions. Physical and cyber protection of critical infrastructure with special attention to the soft targets.			
623Y1MU	Emergency Events Management Solution in Transport Infrastructure	KZ	2
Basic solutions of emergency events with emphasis of the transport infrastructure events and their solution management. Knowledge in the emergency planning and special procedures in liquidation work within the transport infrastructure.			
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.			
623Y1TP	Criminal Law in IT and Transportation	KZ	2
Introduction of criminal law into legal order, conception of culpability and criminal delict, consequency of other legal standards. international treaty and criminal law, investigation of crime, specific indicia of criminal court cases, practical examples.			

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
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

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