Study plan

Name of study plan: Bachelor TET-LED Full-Time from 2024/25

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: 178
Elective courses credits: 2
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Compulsory courses
Minimal number of credits of the block: 166
The role of the block: Z

Code of the group: 1S-BP-TET-20/21
Name of the group: 1st Sem. Bachelor Full-Time TET from 2020/21
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
11CAL1	**Calculus 1** *Tomáš Třasák, Olga Vraštilová, Magdalena Hykšová, Bohumil Kovář, Ondřej Navrátil* ***Bohumil Kovář*** *Ondřej Navrátil (Gar.)*	Z,ZK	7	2P+4C+22B	Z	z
11LA	**Linear Algebra** *Magdalena Hykšová, Lucie Kárná, Pavel Provinský, Martina Bečvářová, Zuzana Malá* ***Magdalena Hykšová*** *Martina Bečvářová (Gar.)*	Z,ZK	3	2P+1C+10B	Z	z
12ZYDI	**Introduction to Transportation Engineering** *Zuzana Čarská, Dagmar Kočárková*	Z,ZK	2	1P+1C	Z	z
18MTY	**Materials Science and Engineering** *Tomáš Doktor, Jan Falta, Petr Koudelka, Tomáš Fíla, Jaromír Kylar, Veronika Drechslerová, Nela Krčmářová, Jitka Řezníčková, Jaroslav Valach, ...* ***Jaroslav Valach*** *Tomáš Doktor (Gar.)*	Z,ZK	3	2P+1C+10B	Z	z
11GIE	**Geometry** *Pavel Provinský, Oldřich Hykš, Šárka Voráčová* ***Oldřich Hykš*** *Oldřich Hykš (Gar.)*	KZ	3	2P+2C+12B	Z	z
14ASD	**Algorithm and Data Structures** *Tomáš Brandejský, Michal Jeřábek, Alena Kubáčová, Jan Procházka, Vít Fábera, Martin Fiala, Lukáš Svoboda, Tereza Panská* ***Vít Fábera*** *Vít Fábera (Gar.)*	KZ	3	0P+2C+8B	Z	z
14KSP	**Constructing with Computer Aid** ***Lukáš Svoboda***	KZ	2	0P+2C+8B	Z	z
18TED	**Technical Documentation** *Jitka Řezníčková, Vít Malinovský* ***Jitka Řezníčková*** *Jitka Řezníčková (Gar.)*	KZ	2	1P+1C+8B	Z	z
15DPLG	**Transportation Psychology**	Z	2	2P+0C+6B	Z	z
16UDOP	**Introduction into Vehicles** *Josef Mík, Zuzana Radová, Petr Bouchner*	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-20/21 Name=1st Sem. Bachelor Full-Time TET from 2020/21

11CAL1	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.			
11LA	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.			

12ZYDI	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.			
18MTY	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.			
11GIE	Geometry	KZ	3
Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet`s trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.			
14ASD	Algorithm and Data Structures	KZ	3
Students will analyze problems, design a theoretical solution to a given problem and write the resulting algorithm using flowcharts, practice reading algorithms written using flowcharts, and use basic Boolean algebra to construct constraints in algorithms. Students will be introduced to the basics of the Python programming language - variable, branching, loops, they will learn to work with variables of basic data types (integer, floating point and string) and the list data structure in their programs.			
14KSP	Constructing with Computer Aid	KZ	2
"CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilites, AutoCAD environment profiles, drawings with raster foundaments).			
18TED	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.			
15DPLG	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.			
16UDOP	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-20/21
Name of the group: 2nd Sem. Bachelor Full-Time TET from 2020/21
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
11CAL2	**Calculus 2** ***Magdalena Hykšová***	Z,ZK	5	2P+3C+20B	L	z
11STAT	**Statistics**	Z,ZK	4	2P+2C+12B	L	z
12ZTS	**Railway Lines and Stations**	Z,ZK	4	2P+2C+10B	L	z
18SAT	**Structural Analysis**	Z,ZK	4	2P+2C+14B	L	z
20SYSA	**Systems Analysis**	Z,ZK	5	2P+2C+14B	L	z
14PRG	**Programming** ***Jana Kaliková***	KZ	2	0P+2C+8B	L	z
17TEDL	**Transport Technology and Logistics**	KZ	3	2P+1C	L	z
21ZALD	**Basics of Air Transport**	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-20/21 Name=2nd Sem. Bachelor Full-Time TET from 2020/21

11CAL2	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.			
11STAT	Statistics	Z,ZK	4
Basics of probability Descriptive statistics Population and sample, limit theorem Point estimate, construction and properties Interval estimates Parametric tests Nonparametric tests Regression and correlation analysis			
12ZTS	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.			
18SAT	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.			

20SYSA	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.			
14PRG	Programming	KZ	2
The Course Programming builds on and fully extends the course 14ASD (Algorithmization and Data Structures). The knowledge of the Python programming language is expanded here so that the participant gains skills and can apply them to solve various follow-up tasks. Main topics: lists, multidimensional arrays, sorting and searching, tuples, sets, dictionaries, working with date and time, regular expressions, functions and procedures, working with files (CSV, JSON, XML).			
17TEDL	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.			
21ZALD	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-24/25
Name of the group: 3rd Sem. Bachelor Full-Time TET from 2024/25
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
11FYZ	**Physics** *Zuzana Malá, Oldřich Hykš, Pavel Demo, Tomáš Vítů, Jana Kuklová* ***Jana Kuklová*** *Pavel Demo (Gar.)*	Z,ZK	5	2P+2C+18B	Z	z
12MDE	**Transport Models and Transport Excesses** *Tomáš Padělek, Josef Kocourek*	Z,ZK	3	2P+1C+8B	Z	z
11TGA	**Graph Theory and its Applications in Transport** *Alena Rybičková, Denisa Mocková, Dušan Teichmann* ***Alena Rybičková*** *Alena Rybičková (Gar.)*	Z,ZK	4	2P+2C+12B	Z	z
18PZP	**Elasticity and Strength** *Tomáš Doktor, Nela Krčmářová, Jitka Řezníčková, Josef Jíra, Jan Šleichrt, Jan Vyčichl, Daniel Kytýř, Ondřej Jiroušek* ***Ondřej Jiroušek*** *Ondřej Jiroušek (Gar.)*	Z,ZK	3	2P+1C+10B	Z	z
20UITS	**Introduction to Intelligent Transport Systems** *Martin Šrotýř, Martin Langr, Jiří Růžička, Patrik Horažďovský, Vladimír Faltus, Pavel Hrubeš, Kristýna Navrátilová, Eva Hajčiarová* ***Martin Langr***	Z,ZK	7	3P+2C+20B	Z	z
12PPOK	**Designing Roads, Highways and Motorways** *Tomáš Padělek, Josef Kocourek, Petr Kumpošt Josef Kocourek (Gar.)*	KZ	3	1P+2C+10B	Z	z
14DATS	**Database Systems** *Jan Krčál, Jana Kaliková* ***Jana Kaliková*** *Jana Kaliková (Gar.)*	KZ	2	1P+1C+10B	Z	z
15JZ1A	**Foreign Language - English 1** *Lenka Monková, Markéta Vojanová, Dana Boušová, Marie Michlová, Marek Tomeček, Jan Feit, Markéta Musilová, Peter Morpuss, Jitka Heřmanová, ... Lenka Monková (Gar.)*	Z	3	0P+4C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S-BP-TET-24/25 Name=3rd Sem. Bachelor Full-Time TET from 2024/25

11FYZ	Physics	Z,ZK	5
Kinematics, dynamics, Newton's laws, force fields, mechanics of continuum, thermodynamics, introduction to electrostatics and electric current.			
12MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.			
11TGA	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.			
18PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joints of structures. Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability.			
20UITS	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.			
12PPOK	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.			

14DATS	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.			
15JZ1A	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-LED-22/23
Name of the group: 4th Sem. Bachelor Full-Time TET-LED from 2022/23
Requirement credits in the group: In this group you have to gain 26 credits
Requirement courses in the group: In this group you have to complete 10 courses
Credits in the group: 26
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
11EMO	**Electromagnetic Field and Optics** ***Zuzana Malá***	Z,ZK	4	2P+1C	L	z
21LEIS	**Aerodromes** ***Ladislav Capoušek***	Z,ZK	3	2P+1C	L	z
21RELP	**Air Traffic Control**	Z,ZK	4	3P+1C	L	z
21ZT	**ATM Systems**	ZK	2	2P+0C	Z,L	z
21ZYT1	**Principles of Flight 1** ***Jakub Trýb***	Z,ZK	3	2P+1C	L	z
16LLA1	**Aircraft 1**	KZ	3	2P+1C	L	z
21RIBZ	**Aviation Safety** ***Andrej Lališ***	KZ	2	2P+0C	L	z
14PGP	**Program Resources** ***Michal Jeřábek***	Z	2	0P+2C	L	z
21SBL1	**Bachelor Thesis Seminar 1** ***Lenka Hanáková***	Z	1	1P+0C	L	z
15JL2A	**Foreign language - English 2 (for LED)**	KZ	2	0P+2C	L	z

Characteristics of the courses of this group of Study Plan: Code=4S-BP-LED-22/23 Name=4th Sem. Bachelor Full-Time TET-LED from 2022/23

11EMO	Electromagnetic Field and Optics	Z,ZK	4
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			
21LEIS	Aerodromes	Z,ZK	3
Basic definitions. Applicability. Airport design. Reference code. Declared distances of runways (RWY). Taxiways and aprons. Clearway. Stopway. Markings of movement areas. Markings. Signs. Markers. Visual aids for denoting obstacles. Obstacle restriction, removal. Visual aids for navigation, lights, approach lighting systems. Visual approach slope indicator systems. Runway lights. Taxiway lights. Visual aids for denoting obstacles.			
21RELP	Air Traffic Control	Z,ZK	4
21ZT	ATM Systems	ZK	2
The course introduces classical and modern facilities, systems and technologies designated for ATS. Student obtains knowledge of technical principles and solutions as far as communication, navigation and surveillance aviation systems are concerned.			
21ZYT1	Principles of Flight 1	Z,ZK	3
Aerodynamic drag, relation between drag and speed, streamline, boundary layer, formula of continuity, formula of Bernoulli, lift and drag, air flow and pressures around wing, angle of attack, reactions of wing in air flow, lift and drag of a wing and an aircraft, coefficient of lift and drag, critical angle of attack, wing with final span, induced drag, interference, devices for lift and drag increase.			
16LLA1	Aircraft 1	KZ	3
Aircraft structural and conceptual design types - definitions and basic knowledge of the problem. Development of requirements, aircraft definitions and categorisation. Aircraft loadings. Systems of primary and secondary airframe structure. Airframe and propulsion unit. Lectures are devoted to aeroplane topics.			
21RIBZ	Aviation Safety	KZ	2
The course contains topics related to the safety management and structure of the SMS. This includes a description of the SMS mechanisms and tools, used to ensure the safe operations. During the course, students are continuously working on the semestral assignment, which helps them to understand practical application of the SMS.			
14PGP	Program Resources	Z	2
Students will be reminded of some aspects of Pythom programming, learn basic concepts and constructs from object-oriented programming and their implementation in Python. They will also try out the basics of working with data libraries in Python, namely NumPy, Pandas, Matplotlib, and practice with examples of smaller and larger data sizes.			
21SBL1	Bachelor Thesis Seminar 1	Z	1
Types of thesis (review, applied research, basic research, thesis dealing with design proposals). Working with citation sources (citation sources, citation databases, citation styles, how to cite). Analyzing the state of the art (standards of research writing). Defining the limitations of the state of the art. Introduction to the thesis methodology.			
15JL2A	Foreign language - English 2 (for LED)	KZ	2
Grammar and technical vocabulary. Selection of conversation topics and professional topics based on students´ level and their focus at Faculty of Transportation Sciences. Development of perceptive and communication skills, ability to give feedback, summarization of a technical text, presentation structure, technical style and its usage, language of management.			

Code of the group: 5S-BP-LED-24/25
Name of the group: 5th Sem. Bachelor Full-Time TET-LED from 2024/25

Requirement credits in the group: In this group you have to gain 26 credits
Requirement courses in the group: In this group you have to complete 11 courses
Credits in the group: 26
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
16LLA2	**Aircraft 2** *Jan Slezáček, Karel Hylmar, Daniel Urban, Karel Mündel*	Z,ZK	2	2P+1C	Z	z
21LGCE	**Air Navigation** *Jan Slezáček*	Z,ZK	3	2P+0C	Z	z
21LGVP	**Legislation and Operational Regulations** *Martin Černotík Martin Černotík (Gar.)*	ZK	4	3P+0C	Z	z
21ZYT2	**Principles of Flight 2** *Jakub Trýb, Přemysl Vávra* ***Jakub Trýb***	Z,ZK	3	2P+1C	Z	z
22SELN	**Air Accident Investigation** *Karel Mündel, Michal Frydrýn* ***Michal Frydrýn*** *Karel Mündel (Gar.)*	ZK	2	2P+0C	Z	z
14ZDAL	**Data processing in air transport** *Martin Šrotýř* ***Martin Šrotýř*** *Martin Šrotýř (Gar.)*	KZ	2	0P+2C	Z	z
21MEOL	**Meteorology** *Iveta Kameníková* ***Iveta Kameníková***	KZ	3	2P+1C	Z	z
21SYLP	**Airport Security** *Lukáš Popek* ***Lukáš Popek*** *Andrej Lališ (Gar.)*	KZ	2	2P+0C	Z	z
21LGL1	**Aviation English 1** *Jitka Heřmanová* ***Jitka Heřmanová***	Z	2	0P+2C	Z	z
21SBL2	**Bachelor Thesis Seminar 2** *Jakub Trýb, Vladimír Socha, Lenka Hanáková, Marta Urbanová* ***Marta Urbanová***	Z	1	1P+0C	Z	z
15JL3A	**Foreign language - English 3 (for LED)** *Lenka Monková, Markéta Vojanová, Dana Boušová, Marie Michlová, Marek Tomeček, Jan Feit, Markéta Musilová, Peter Morpuss, Jitka Heřmanová, ...*	KZ	2	0P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5S-BP-LED-24/25 Name=5th Sem. Bachelor Full-Time TET-LED from 2024/25

16LLA2	Aircraft 2	Z,ZK	2
Manufacturers responsibility, responsibilities of operator and professional supervising. Legislation in area of airworthiness. International and national standards. Static solidity of aircraft structures. Aeroelasticity. Inherent and operational reliability of aircraft structure. Fatigue strength. Aircraft structure lifetime presumption.			
21LGCE	Air Navigation	Z,ZK	3
Earth - its shape, parameters and properties. Aeronautical charts and their use. Measuring time. Dead reckoning. Radionavigation aids. Global navigation satellite systems. Air traffic services routes and their design.			
21LGVP	Legislation and Operational Regulations	ZK	4
Introduction into aviation regulations. The scope of international and national organizations in civil aviation. Analysis and interpretation of the ICAO Annexes 1-19, ICAO Docs. 4444, 7030, 8168. Introduction to the European Parliament and Council Regulation (EC), Commission Regulation (EU) and the Decisions of the Executive Director of EASA.			
21ZYT2	Principles of Flight 2	Z,ZK	3
Static & dynamic longitudinal stability, neutral point, location of centre of gravity, static directional & lateral stability, dynamic directional & lateral stability, control pitch (longitudinal), yaw (directional) & roll (lateral), roll/yaw interaction, trimming, speed of sound, Mach number, compressibility, shock waves, critical Mach number, aerodynamic heating, operating limitations, manoeuvring envelope, gust-load diagram.			
22SELN	Air Accident Investigation	ZK	2
Introduction and legislation (ICAO, EU, Czechia) related to air accident investigation. Obligations arising from legislative requirements for individual States in the event of an air accident, investigation process. Air accident site (inspector's equipment, site security, personal protection, initial activities at the site, sketch, evidence, etc.). Aircraft and crew documentation. Final report (formalities, substantive content, contribution).			
14ZDAL	Data processing in air transport	KZ	2
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.			
21MEOL	Meteorology	KZ	3
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospherical fronts. Atmospherical rainfall, origin fission. Turbulence. Powers causing wind. Cyclone and anticyclone. Gradient wind. Geostrofical and geocyklostrofical wind. Visibilities in air transport. Dangerous meteorological aspects. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological informations.			
21SYLP	Airport Security	KZ	2
Definition of aviation security and unlawful acts against the civil aviation. Description of threats, risks, causes and goals of Security. Overview of national and international regulations and their relevance to airport security. Security control devices. Operational efficiency factors and related variables. Basic use of queueing theory and optimization tasks.			
21LGL1	Aviation English 1	Z	2
Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.			
21SBL2	Bachelor Thesis Seminar 2	Z	1
Methodology of thesis writing (introduction, analysis of the current state, specification of the problem, objectives and hypotheses). Definition of materials and methods, approach to obtaining results, presentation and discussion of results, formulation of thesis conclusions. Basics of LaTeX, working with LaTeX and Word template.			
15JL3A	Foreign language - English 3 (for LED)	KZ	2
Grammar and technical vocabulary. Selection of conversation topics and professional topics based on students´ level and their focus at Faculty of Transportation Sciences. Development of perceptive and communication skills, ability to give feedback, summarization of a technical text, presentation structure, technical style and its usage, language of management.			

Code of the group: 6S-BP-LED-23/24

Name of the group: 6th Sem. Bachelor Full-Time TET-LED from 2023/24
Requirement credits in the group: In this group you have to gain 24 credits
Requirement courses in the group: In this group you have to complete 8 courses
Credits in the group: 24
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
11MSP	**Modeling of Systems and Processes** ***Bohumil Kovář***	Z,ZK	4	2P+2C+12B	L	z
21EMIL	**Air Transport Economy** ***Peter Vittek***	Z,ZK	5	3P+1C	L	z
21LMR1	**Aircraft Engines 1**	ZK	3	2P+0C	L	z
21LVYO	**Human Performance and Limitations**	ZK	3	2P+0C	L	z
21PAP	**Flight Planning and Performance** ***Ladislav Capoušek***	Z,ZK	4	2P+2C+14B	L	z
21LGL2	**Aviation English 2**	KZ	2	0P+2C	L	z
21SBL3	**Bachelor Thesis Seminar 3** ***Lenka Hanáková***	Z	1	1P+0C	L	z
15JL4A	**Foreign language - English 4 (for LED)**	ZK	2	0P+2C	L	z

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

11MSP	Modeling of Systems and Processes	Z,ZK	4
System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of 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.			
21EMIL	Air Transport Economy	Z,ZK	5
The course focuses on the fundamentals of economics, providing students with an understanding of accounting principles and role of financial statements. In the second part, the course builds on the general knowledge acquired and applies it to the environment of air transport economics. The basic principle is the Holloway model, which structures knowledge about demand, price and yield on the one hand, and supply, costs and expenses on the other.			
21LMR1	Aircraft Engines 1	ZK	3
Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characterictics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.			
21LVYO	Human Performance and Limitations	ZK	3
Human performace & limitations, aptibility & competence, accident statistics, flight safety, basics of flight physiology, man & environment, breathing & circulation, sensory system, health & hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & learning, theory & model of human error, body rhythms & sleep, stress, fatigue, working methods.			
21PAP	Flight Planning and Performance	Z,ZK	4
Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.			
21LGL2	Aviation English 2	KZ	2
Terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems.			
21SBL3	Bachelor Thesis Seminar 3	Z	1
Formal and graphic design of the thesis. Data collection and presentation, basic statistical reasoning, validation of results and designs. Achieving the objectives of the thesis and evaluation of hypothesis tests. Preparation of the presentation, principles of presentation of the thesis.			
15JL4A	Foreign language - English 4 (for LED)	ZK	2
Grammar and technical vocabulary. Selection of conversation topics and professional topics based on students´ level and their focus at Faculty of Transportation Sciences. Development of perceptive and communication skills, ability to give feedback, summarization of a technical text, presentation structure, technical style and its usage, language of management.			

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

Code of the group: X1-BP-LED-22/23
Name of the group: Research Groups Bachelor Full-Time TET-LED 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 3 courses
Credits in the group: 6
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
16X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
15X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
14X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
12X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
11X31L	**Project 1 LED** ***Michal Matowicki***	Z	2	0P+1C	L	ZP
23X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
18X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
20X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
21X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
22X31L	**Project 1 LED** ***Zdeněk Svatý***	Z	2	0P+1C	L	ZP
17X31L	**Project 1 LED**	Z	2	0P+1C	L	ZP
16X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
15X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
14X32L	**Project 2 LED** *Tomáš Brandejský, Vít Fábera, Jan Krčál, Jana Kaliková, Mária Jánešová*	Z	2	0P+1C	Z	ZP
12X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
11X32L	**Project 2 LED** *Magdalena Hykšová, Jana Kuklová, Michal Matowicki* ***Jana Kuklová*** *Michal Matowicki (Gar.)*	Z	2	0P+1C	Z	ZP
17X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
23X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
22X32L	**Project 2 LED** *Michal Frydrýn, Zdeněk Svatý*	Z	2	0P+1C	Z	ZP
21X32L	**Project 2 LED** *Jakub Trýb, Iveta Kameníková, Lukáš Popek, Andrej Lališ, Vladimír Socha, Lenka Hanáková, Bo Stloukal, Stanislav Pleninger, Ladislav Capoušek, ...*	Z	2	0P+1C	Z	ZP
20X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
18X32L	**Project 2 LED**	Z	2	0P+1C	Z	ZP
11X33L	**Project 3 LED** ***Jana Kuklová***	Z	2	0P+3C	L	ZP
12X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
14X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
15X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
16X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
23X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
21X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
20X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
18X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
17X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP
22X33L	**Project 3 LED**	Z	2	0P+3C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=X1-BP-LED-22/23 Name=Research Groups Bachelor Full-Time TET-LED from 2022/23

16X31L	Project 1 LED	Z	2
15X31L	Project 1 LED	Z	2
14X31L	Project 1 LED	Z	2
12X31L	Project 1 LED	Z	2
11X31L	Project 1 LED	Z	2
23X31L	Project 1 LED	Z	2
18X31L	Project 1 LED	Z	2
20X31L	Project 1 LED	Z	2
21X31L	Project 1 LED	Z	2
22X31L	Project 1 LED	Z	2
17X31L	Project 1 LED	Z	2
16X32L	Project 2 LED	Z	2
15X32L	Project 2 LED	Z	2
14X32L	Project 2 LED	Z	2

12X32L	Project 2 LED	Z	2
11X32L	Project 2 LED	Z	2
17X32L	Project 2 LED	Z	2
23X32L	Project 2 LED	Z	2
22X32L	Project 2 LED	Z	2
21X32L	Project 2 LED	Z	2
20X32L	Project 2 LED	Z	2
18X32L	Project 2 LED	Z	2
11X33L	Project 3 LED	Z	2
12X33L	Project 3 LED	Z	2
14X33L	Project 3 LED	Z	2
15X33L	Project 3 LED	Z	2
16X33L	Project 3 LED	Z	2
23X33L	Project 3 LED	Z	2
21X33L	Project 3 LED	Z	2
20X33L	Project 3 LED	Z	2
18X33L	Project 3 LED	Z	2
17X33L	Project 3 LED	Z	2
22X33L	Project 3 LED	Z	2

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

Code of the group: Y1-BP-LED-24/25
Name of the group: Comp. Sel. Courses Bachelor Full-Time TET-LED from 2024/25
Requirement credits in the group: In this group you have to gain 6 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 6
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
21Y1AM	**Aeronautical Information Management (AIM)** *Radek Hodač* ***Radek Hodač*** *Radek Hodač (Gar.)*	KZ	2	2P+0C	Z	PV
00Y1XB	**Active Participation in a Scientific Project, Workshop, Short-Term Trip Abroad** *Tomáš Padělek* ***Patrik Horažďovský*** *Tomáš Padělek (Gar.)*	KZ	2	2P+0C		PV
20Y1AF	**Alternative Forms of Transportation Project Financing** *Mária Jánešová* ***Mária Jánešová*** *Mária Jánešová (Gar.)*	KZ	2	2P+0C	Z	PV
18Y1AM	**Anatomy, Mobility and Safety of Man**	KZ	2	2P+0C	Z	PV
14Y1AV	**Animation and Visualization**	KZ	2	2P+0C	L	PV
12Y1AE	**Applied Ecology**	KZ	2	2P+0C	Z	PV
20Y1AE	**Applied Electronics**	KZ	2	2P+0C	Z	PV
14Y1BE	**Barrierless Transport** ***Jan Krčál***	KZ	2	2P+0C	L	PV
15Y1BO	**Work Safety and Health Protection in Transportation**	KZ	2	2P+0C	L,Z	PV
11Y1BK	**Error Detection Codes for Interlocking Systems** *Lucie Kárná* ***Lucie Kárná*** *Lucie Kárná (Gar.)*	KZ	2	2P+0C	Z	PV
21Y1BS	**Unmanned aircraft systems 1**	KZ	2	2P+0C	L	PV
14Y1BM	**Biometric Methods**	KZ	2	2P+0C	Z	PV
15Y1DZ	**History of Railway**	KZ	2	2P+0C	L	PV
12Y1DS	**Project Documentation in Practice**	KZ	2	2P+0C	Z	PV
17Y1EV	**Public Sector Economy**	KZ	2	2P+0C	Z	PV
23Y1EH	**Electronics and hardware in security of transportation**	KZ	2	2P+0C	L	PV
20Y1EK	**Qualification in Electrical Engineering**	KZ	2	2P+0C	L	PV
16Y1EN	**Energy Requirements of Vehicles**	KZ	2	2P+0C	L	PV
20Y1EA	**Environmental Aspects of Transport**	KZ	2	2P+0C	Z	PV
15Y1EH	**European Integration within Historical Context** *Jan Feit Jan Feit (Gar.)*	KZ	2	2P+0C	Z	PV

18Y1EM	**Experimental Methods in Mechanics** *Daniel Kytýř* ***Daniel Kytýř*** *Daniel Kytýř (Gar.)*	KZ	2	2P+0C	Z,L	PV
15Y1FD	**French Area Studies and Transportation**	KZ	2	2P+0C	L	PV
14Y1HW	**Computer Hardware**	KZ	2	2P+0C	L	PV
15Y1HL	**History of Civil Aviation** ***Jakub Kraus***	KZ	2	2P+0C	L	PV
15Y1HD	**History of City Mass Transport** *Milan Dont Milan Dont (Gar.)*	KZ	2	2P+0C	Z	PV
12Y1HD	**Traffic Noise**	KZ	2	2P+0C	L	PV
15Y1HE	**Work Hygiene and Ergonomics in Traffic** *Petr Musil Petr Musil (Gar.)*	KZ	2	2P+0C	Z	PV
16Y1IS	**Interactive Simulators and Simulations**	KZ	2	2P+0C	L,Z	PV
12Y1KN	**Combined Transportation** *Petr Nejedlý Petr Nejedlý (Gar.)*	KZ	2	2P+0C	Z	PV
12Y1KP	**Communication and Promotion of Transport Projects**	KZ	2	2P+0C	L	PV
20Y1KP	**Communication and Presentation Skills** *Jiří Růžička, Kristýna Navrátilová* ***Jiří Růžička*** *Jiří Růžička (Gar.)*	KZ	2	2P+0C	Z	PV
23Y1KM	**Crisis Management**	KZ	2	2P+0C	Z	PV
23Y1KO	**Quantum Physics and Optoelectronics**	KZ	2	2P+0C	L	PV
23Y1KY	**Cybernality**	KZ	2	2P+0C	L	PV
23Y1KB	**Cyber security in transportation**	KZ	2	2P+0C	L	PV
21Y1LJ	**Aeronautical Radio and Flight Instruments**	KZ	2	2P+0C	L	PV
21Y1LS	**Air Traffic Services**	KZ	2	2P+0C	L	PV
17Y1LL	**Logistics of Passenger and Freight Air Transport**	KZ	2	2P+0C	L,Z	PV
20Y1LN	**Location and Navigation**	KZ	2	2P+0C	L	PV
23Y1MK	**Crisis Situation Management in Critical Infrastructure**	KZ	2	2P+0C	L	PV
23Y1MU	**Emergency Events Management Solution in Transport Infrastructure**	KZ	2	2P+0C	Z	PV
17Y1MD	**Marketing in Transportation**	KZ	2	2P+0C	Z	PV
18Y1MT	**Engineering Materials** ***Jaroslav Valach***	KZ	2	2P+0C	L,Z	PV
21Y1MP	**Matlab for project-oriented study** *Vladimír Socha, Lenka Hanáková* ***Lenka Hanáková*** *Vladimír Socha (Gar.)*	KZ	2	2P+0C	Z	PV
14Y1MP	**Modeling Complex Assemblies and Models in Parametric Modeller**	KZ	2	2P+0C	Z	PV
15Y1MK	**Modern History in Context: Every Day Life and Transport**	KZ	2	2P+0C	L	PV
15Y1NE	**German in the Economy and Society** *Jan Feit*	KZ	2	2P+0C	Z	PV
21Y1OH	**Airline Business and Operations** *Peter Olexa* ***Peter Olexa*** *Peter Olexa (Gar.)*	KZ	2	2P+0C	Z	PV
23Y1OK	**Protection of Critical Objects and Infrastructures**	KZ	2	2P+0C	L	PV
20Y1OI	**Fare Collection and Information Systems**	KZ	2	2P+0C	L	PV
14Y1OJ	**Object - oriented programming in JAVA**	KZ	2	2P+0C	L	PV
14Y1OP	**Operating System**	KZ	2	2P+0C	Z	PV
17Y1OF	**Personal Finance**	KZ	2	2P+0C	Z,L	PV
20Y1OK	**Road Lighting**	KZ	2	2P+0C	L	PV
11Y1PV	**Parametrical and Multicriterial Programming** *Olga Vraštilová* ***Olga Vraštilová*** *Olga Vraštilová (Gar.)*	KZ	2	2P+0C	Z	PV
17Y1PM	**Personnel Management**	KZ	2	2P+0C	L	PV
12Y1PC	**Pedestrian and Cycling Transport**	KZ	2	2P+0C	L,Z	PV
14Y1PG	**Computer Graphics**	KZ	2	2P+0C	L	PV
14Y1P2	**Computer Aid of Transportation Projecting 2**	KZ	2	2P+0C	Z	PV
18Y1PS	**Computer Simulations in Mechanics**	KZ	2	2P+0C	L	PV
14Y1PI	**Corporate Information System**	KZ	2	2P+0C	Z	PV
14Y1PZ	**Advanced Data Processing in Spreadsheets**	KZ	2	2P+0C	Z	PV
21Y1PC	**ATC Procedures and Activities** *Terézia Pilmannová* ***Terézia Pilmannová*** *Terézia Pilmannová (Gar.)*	KZ	2	2P+0C	Z	PV
12Y1PD	**Assessment of Transport Structures**	KZ	2	2P+0C	Z	PV
20Y1PK	**Product Quality Management Processes** *Martin Leso* ***Martin Leso*** *Martin Leso (Gar.)*	KZ	2	2P+0C	Z	PV
14Y1PJ	**C Programming Language**	KZ	2	2P+0C	Z	PV

12Y1C1	**Designing Roads in Civil 3D I**	KZ	2	2P+0C	L,Z	PV
12Y1C2	**Designing Roads in Civil 3D II** *Tomáš Honc Tomáš Honc (Gar.)*	KZ	2	2P+0C	Z,L	PV
14Y1PA	**3D Modeling in AutoCAD**	KZ	2	2P+0C	Z	PV
16Y1PV	**Operation, Construction and Maintenance of Vehicles**	KZ	2	2P+0C	L	PV
12Y1PU	**Organization Disposition of Railway Stations**	KZ	2	2P+0C	L	PV
12Y1RU	**Railway Lines Reconstruction**	KZ	2	2P+0C	Z	PV
16Y1RE	**Control and Electronic Vehicle Systems** *Josef Mík, Přemysl Toman Josef Mík (Gar.)*	KZ	2	2P+0C	Z	PV
21Y1RZ	**Human Resources Management**	KZ	2	2P+0C	L	PV
17Y1ST	**Titan Simulation**	KZ	2	2P+0C	L	PV
21Y1SI	**ATC Simulator**	KZ	2	2P+0C	L	PV
20Y1SC	**Sensors and Actuators**	KZ	2	2P+0C	L	PV
17Y1SL	**Sociology of Human Resources**	KZ	2	2P+0C	Z	PV
11Y1SI	**Transportation Software Engineering**	KZ	2	2P+0C	Z	PV
16Y1KS	**Quality and Reliability of Vehicles** *Jaroslav Machan, Filip Kotas Jaroslav Machan (Gar.)*	KZ	2	2P+0C	Z	PV
12Y1SU	**Road Management and Maintenance**	KZ	2	2P+0C	L	PV
16Y1SO	**Strategy and innovation in mobility**	KZ	2	2P+0C	Z	PV
17Y1SK	**Urban and Regional Rail Transport Systems**	KZ	2	2P+0C	L,Z	PV
11Y1TG	**Graph Theory** ***Lucie Kárná***	KZ	2	2P+0C	L	PV
23Y1TP	**Criminal Law in IT and Transportation**	KZ	2	2P+0C	Z	PV
14Y1TI	**Creating Interactive Internet Applications**	KZ	2	2P+0C	L	PV
21Y1UL	**Aircraft Maintenance**	KZ	2	2P+0C	L	PV
14Y1UP	**Editing of Theses in MS Word**	KZ	2	2P+0C	L	PV
18Y1UK	**Introduction of Rail Vehicles**	KZ	2	2P+0C	L	PV
12Y1VR	**Public Transport in Cities and Regions** *Vladimír Pušman Vladimír Pušman (Gar.)*	KZ	2	2P+0C	Z	PV
23Y1VS	**Negotiation and Cooperation**	KZ	2	2P+0C	Z	PV
14Y1VM	**Development of Applications for Mobile Devices**	KZ	2	2P+0C	Z	PV
16Y1VT	**Development in Railroad Vehicles**	KZ	2	2P+0C	L	PV
14Y1WG	**Webdesign**	KZ	2	2P+0C	Z	PV
14Y1W1	**Webdesign 1**	KZ	2	2P+0C	Z	PV
14Y1W2	**Webdesign 2**	KZ	2	2P+0C	L	PV
16Y1ZG	**Introduction into Applied Computer Graphics**	KZ	2	2P+0C	L	PV
14Y1ZM	**Fundamentals of Parametric and Adaptive Modeling**	KZ	2	2P+0C	L	PV
11Y1ZM	**Foundation of MATLAB Programming** ***Šárka Voráčová***	KZ	2	2P+0C	L	PV
14Y1ZJ	**Fundamentals of programming in JAVA**	KZ	2	2P+0C	Z	PV
12Y1ZU	**Principles of Urbanism** *Karel Hájek Karel Hájek (Gar.)*	KZ	2	2P+0C	Z,L	PV
15Y1ZV	**East-West dichotomy: Prelude to the Cold War** *Marie Michlová* ***Marie Michlová*** *Marie Michlová (Gar.)*	KZ	2	2P+0C	Z	PV
16Y1ZL	**Vehicle Testing, Legislation and Construction**	KZ	2	2P+0C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=Y1-BP-LED-24/25 Name=Comp. Sel. Courses Bachelor Full-Time TET-LED from 2024/25

21Y1AM	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).			
00Y1XB	Active Participation in a Scientific Project, Workshop, Short-Term Trip Abroad	KZ	2
20Y1AF	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.			
18Y1AM	Anatomy, Mobility and Safety of Man	KZ	2
Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous 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.			

14Y1AV	Animation and Visualization	KZ	2
Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and 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.			
12Y1AE	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.			
20Y1AE	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).			
14Y1BE	Barrierless Transport	KZ	2
The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students 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.			
15Y1BO	Work Safety and Health Protection in Transportation	KZ	2
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
11Y1BK	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.			
21Y1BS	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.			
14Y1BM	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.			
15Y1DZ	History of Railway	KZ	2
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First 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.			
12Y1DS	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.			
17Y1EV	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.			
23Y1EH	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.			
20Y1EK	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.			
16Y1EN	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.			
20Y1EA	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.			
15Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. 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.			
18Y1EM	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.			
15Y1FD	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.			
14Y1HW	Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
15Y1HL	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.			
15Y1HD	History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends 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.			

12Y1HD	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.			
15Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of 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 a man. Practical examples from the field of transportation; relevant legislature.			
16Y1IS	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.			
12Y1KN	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.			
12Y1KP	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.			
20Y1KP	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.			
23Y1KM	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.			
23Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
23Y1KY	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.			
23Y1KB	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.			
21Y1LJ	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.			
21Y1LS	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.			
17Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
20Y1LN	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.			
23Y1MK	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.			
23Y1MU	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.			
17Y1MD	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.			
18Y1MT	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.			
21Y1MP	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.			
14Y1MP	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.			
15Y1MK	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.			
15Y1NE	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.			
21Y1OH	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.			

23Y1OK	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.			
20Y1OI	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).			
14Y1OJ	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.			
14Y1OP	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.			
17Y1OF	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).			
20Y1OK	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.			
11Y1PV	Parametrical and Multicriterial Programming	KZ	2
Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear constraints. Computation of efficient solution.			
17Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
12Y1PC	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.			
14Y1PG	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.			
14Y1P2	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.			
18Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of tools 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.			
14Y1PI	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.			
14Y1PZ	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.			
21Y1PC	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.			
12Y1PD	Assessment of Transport Structures	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.			
20Y1PK	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.			
14Y1PJ	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.			
12Y1C1	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.			
12Y1C2	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.			
14Y1PA	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.			

16Y1PV	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.			
12Y1PU	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.			
12Y1RU	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.			
16Y1RE	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.			
21Y1RZ	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.			
17Y1ST	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.			
21Y1SI	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.			
20Y1SC	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.			
17Y1SL	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.			
11Y1SI	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.			
16Y1KS	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.			
12Y1SU	Road Management and Maintenance	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.			
16Y1SO	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.			
17Y1SK	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.			
11Y1TG	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, heuristic approach.			
23Y1TP	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.			
14Y1TI	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.			
21Y1UL	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.			
14Y1UP	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.			
18Y1UK	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.			

12Y1VR	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.			
23Y1VS	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.			
14Y1VM	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.			
16Y1VT	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.			
14Y1WG	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.			
14Y1W1	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.			
14Y1W2	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.			
16Y1ZG	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.			
14Y1ZM	Fundamentals of Parametric and Adaptive Modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
11Y1ZM	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.			
14Y1ZJ	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.			
12Y1ZU	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.			
15Y1ZV	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.			
16Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle, bus and motorbike costruction, aggregate computing, driving resistance, build and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, technical legislation creation, 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
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
14DPK	**Digital Support for Designing of Roads and Highways** *Libor Žídek, Drahomír Schmidt* ***Drahomír Schmidt*** *Drahomír Schmidt (Gar.)*	Z	0	0P+2C	Z	v
14DZT	**Digital Support for Railway Lines**	Z	0	0P+2C	L	v
11SCFZ	**Seminar of Physics** *Zuzana Malá, Oldřich Hykš, Tomáš Vítů, Jana Kuklová* ***Zuzana Malá*** *Zuzana Malá (Gar.)*	Z	0	0P+2C	Z	v

21SLD	**Seminar of Air Transport**	Z	0	0P+2C	L	v
18SPP	**Seminary from Elasticity and Strength** *Tomáš Doktor, Jan Vyčichl* ***Jan Vyčichl*** *Jan Vyčichl (Gar.)*	Z	0	0P+2C	Z	v
18STD	**Seminary from Technical Documentation**	Z	0	0P+2C	Z	v
18SS	**Seminary from Structural Analysis**	Z	0	0P+2C	L	v
11SSF	**Secondary School Physics Course** ***Zuzana Malá***	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 Name=Bachelor Full-Time TET voluntary

14DPK	Digital Support for Designing of Roads and Highways	Z	0
Seminars possibilities of technical processing problems focused on designing of roads and highways.			
14DZT	Digital Support for Railway Lines	Z	0
Seminars possibilities of technical processing problems solved in the field of railway lines.			
11SCFZ	Seminar of Physics	Z	0
Solving problems on kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
21SLD	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.			
18SPP	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.			
18STD	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.			
18SS	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.			
11SSF	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

Code of the group: VP-BP-TET-LED
Name of the group: Bachelor Full-Time TET-LED 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**
11SEMO	**Seminar of Electromagnetic Field and Optics** ***Zuzana Malá***	Z	0	0P+2C	L	v

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

11SEMO	Seminar of Electromagnetic Field and Optics	Z	0
Solving problems on electric and magnetic field, electromagnetic field, optics and basics of solid-state physics.			

List of courses of this pass:

Code	**Name of the course**	**Completion**	**Credits**
00Y1XB	Active Participation in a Scientific Project, Workshop, Short-Term Trip Abroad	KZ	2
11CAL1	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.			
11CAL2	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.			

11EMO	Electromagnetic Field and Optics	Z,ZK	4
	Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.		
11FYZ	Physics	Z,ZK	5
	Kinematics, dynamics, Newton's laws, force fields, mechanics of continuum, thermodynamics, introduction to electrostatics and electric current.		
11GIE	Geometry	KZ	3
	Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet`s trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.		
11LA	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.		
11MSP	Modeling of Systems and Processes	Z,ZK	4
	System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of 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.		
11SCFZ	Seminar of Physics	Z	0
	Solving problems on kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.		
11SEMO	Seminar of Electromagnetic Field and Optics	Z	0
	Solving problems on electric and magnetic field, electromagnetic field, optics and basics of solid-state physics.		
11SSF	Secondary School Physics Course	Z	0
	Basics of kinematics, dynamics, thermodynamics, electric field and magnetic field.		
11STAT	Statistics	Z,ZK	4
	Basics of probability Descriptive statistics Population and sample, limit theorem Point estimate, construction and properties Interval estimates Parametric tests Nonparametric tests Regression and correlation analysis		
11TGA	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.		
11X31L	Project 1 LED	Z	2
11X32L	Project 2 LED	Z	2
11X33L	Project 3 LED	Z	2
11Y1BK	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.		
11Y1PV	Parametrical and Multicriterial Programming	KZ	2
	Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear constraints. Computation of efficient solution.		
11Y1SI	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.		
11Y1TG	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, heuristic approach.		
11Y1ZM	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.		
12MDE	Transport Models and Transport Excesses	Z,ZK	3
	Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.		
12PPOK	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.		
12X31L	Project 1 LED	Z	2
12X32L	Project 2 LED	Z	2
12X33L	Project 3 LED	Z	2
12Y1AE	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.		
12Y1C1	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.		
12Y1C2	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.		
12Y1DS	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.		

12Y1HD	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.			
12Y1KN	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.			
12Y1KP	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.			
12Y1PC	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.			
12Y1PD	Assessment of Transport Structures	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.			
12Y1PU	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.			
12Y1RU	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.			
12Y1SU	Road Management and Maintenance	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.			
12Y1VR	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.			
12Y1ZU	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.			
12ZTS	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.			
12ZYDI	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.			
14ASD	Algorithm and Data Structures	KZ	3
Students will analyze problems, design a theoretical solution to a given problem and write the resulting algorithm using flowcharts, practice reading algorithms written using flowcharts, and use basic Boolean algebra to construct constraints in algorithms. Students will be introduced to the basics of the Python programming language - variable, branching, loops, they will learn to work with variables of basic data types (integer, floating point and string) and the list data structure in their programs.			
14DATS	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.			
14DPK	Digital Support for Designing of Roads and Highways	Z	0
Seminars possibilities of technical processing problems focused on designing of roads and highways.			
14DZT	Digital Support for Railway Lines	Z	0
Seminars possibilities of technical processing problems solved in the field of railway lines.			
14KSP	Constructing with Computer Aid	KZ	2
"CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilites, AutoCAD environment profiles, drawings with raster foundaments).			
14PGP	Program Resources	Z	2
Students will be reminded of some aspects of Pythom programming, learn basic concepts and constructs from object-oriented programming and their implementation in Python. They will also try out the basics of working with data libraries in Python, namely NumPy, Pandas, Matplotlib, and practice with examples of smaller and larger data sizes.			
14PRG	Programming	KZ	2
The Course Programming builds on and fully extends the course 14ASD (Algorithmization and Data Structures). The knowledge of the Python programming language is expanded here so that the participant gains skills and can apply them to solve various follow-up tasks. Main topics: lists, multidimensional arrays, sorting and searching, tuples, sets, dictionaries, working with date and time, regular expressions, functions and procedures, working with files (CSV, JSON, XML).			
14X31L	Project 1 LED	Z	2
14X32L	Project 2 LED	Z	2
14X33L	Project 3 LED	Z	2
14Y1AV	Animation and Visualization	KZ	2
Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and 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.			

14Y1BE	Barrierless Transport	KZ	2
The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students 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.			
14Y1BM	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.			
14Y1HW	Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
14Y1MP	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.			
14Y1OJ	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.			
14Y1OP	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.			
14Y1P2	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.			
14Y1PA	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.			
14Y1PG	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.			
14Y1PI	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.			
14Y1PJ	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.			
14Y1PZ	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.			
14Y1TI	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.			
14Y1UP	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.			
14Y1VM	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.			
14Y1W1	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.			
14Y1W2	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.			
14Y1WG	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.			
14Y1ZJ	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.			
14Y1ZM	Fundamentals of Parametric and Adaptive Modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
14ZDAL	Data processing in air transport	KZ	2
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.			

15DPLG	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.			
15JL2A	Foreign language - English 2 (for LED)	KZ	2
Grammar and technical vocabulary. Selection of conversation topics and professional topics based on students´ level and their focus at Faculty of Transportation Sciences. Development of perceptive and communication skills, ability to give feedback, summarization of a technical text, presentation structure, technical style and its usage, language of management.			
15JL3A	Foreign language - English 3 (for LED)	KZ	2
Grammar and technical vocabulary. Selection of conversation topics and professional topics based on students´ level and their focus at Faculty of Transportation Sciences. Development of perceptive and communication skills, ability to give feedback, summarization of a technical text, presentation structure, technical style and its usage, language of management.			
15JL4A	Foreign language - English 4 (for LED)	ZK	2
Grammar and technical vocabulary. Selection of conversation topics and professional topics based on students´ level and their focus at Faculty of Transportation Sciences. Development of perceptive and communication skills, ability to give feedback, summarization of a technical text, presentation structure, technical style and its usage, language of management.			
15JZ1A	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.			
15X31L	Project 1 LED	Z	2
15X32L	Project 2 LED	Z	2
15X33L	Project 3 LED	Z	2
15Y1BO	Work Safety and Health Protection in Transportation	KZ	2
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
15Y1DZ	History of Railway	KZ	2
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First 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.			
15Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. 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.			
15Y1FD	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.			
15Y1HD	History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends 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.			
15Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of 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 a man. Practical examples from the field of transportation; relevant legislature.			
15Y1HL	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.			
15Y1MK	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.			
15Y1NE	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.			
15Y1ZV	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.			
16LLA1	Aircraft 1	KZ	3
Aircraft structural and conceptual design types - definitions and basic knowledge of the problem. Development of requirements, aircraft definitions and categorisation. Aircraft loadings. Systems of primary and secondary airframe structure. Airframe and propulsion unit. Lectures are devoted to aeroplane topics.			
16LLA2	Aircraft 2	Z,ZK	2
Manufacturers responsibility, responsibilities of operator and professional supervising. Legislation in area of airworthiness. International and national standards. Static solidity of aircraft structures. Aeroelasticity. Inherent and operational reliability of aircraft structure. Fatigue strength. Aircraft structure lifetime presumption.			
16UDOP	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.			
16X31L	Project 1 LED	Z	2
16X32L	Project 2 LED	Z	2
16X33L	Project 3 LED	Z	2
16Y1EN	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.			
16Y1IS	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.			

16Y1KS	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.			
16Y1PV	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.			
16Y1RE	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.			
16Y1SO	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.			
16Y1VT	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.			
16Y1ZG	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.			
16Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle, bus and motorbike costruction, aggregate computing, driving resistance, build and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, technical legislation creation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.			
17TEDL	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.			
17X31L	Project 1 LED	Z	2
17X32L	Project 2 LED	Z	2
17X33L	Project 3 LED	Z	2
17Y1EV	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.			
17Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
17Y1MD	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.			
17Y1OF	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).			
17Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
17Y1SK	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.			
17Y1SL	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.			
17Y1ST	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.			
18MTY	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.			
18PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joints of structures. Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability.			
18SAT	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.			
18SPP	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.			

18SS	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.			
18STD	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.			
18TED	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.			
18X31L	Project 1 LED	Z	2
18X32L	Project 2 LED	Z	2
18X33L	Project 3 LED	Z	2
18Y1AM	Anatomy, Mobility and Safety of Man	KZ	2
Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous 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.			
18Y1EM	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.			
18Y1MT	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.			
18Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of tools 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.			
18Y1UK	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.			
20SYSA	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.			
20UITS	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.			
20X31L	Project 1 LED	Z	2
20X32L	Project 2 LED	Z	2
20X33L	Project 3 LED	Z	2
20Y1AE	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).			
20Y1AF	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.			
20Y1EA	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.			
20Y1EK	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.			
20Y1KP	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.			
20Y1LN	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.			
20Y1OI	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).			

20Y1OK	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.			
20Y1PK	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.			
20Y1SC	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.			
21EMIL	Air Transport Economy	Z,ZK	5
The course focuses on the fundamentals of economics, providing students with an understanding of accounting principles and role of financial statements. In the second part, the course builds on the general knowledge acquired and applies it to the environment of air transport economics. The basic principle is the Holloway model, which structures knowledge about demand, price and yield on the one hand, and supply, costs and expenses on the other.			
21LEIS	Aerodromes	Z,ZK	3
Basic definitions. Applicability. Airport design. Reference code. Declared distances of runways (RWY). Taxiways and aprons. Clearway. Stopway. Markings of movement areas. Markings. Signs. Markers. Visual aids for denoting obstacles. Obstacle restriction, removal. Visual aids for navigation, lights, approach lighting systems. Visual approach slope indicator systems. Runway lights. Taxiway lights. Visual aids for denoting obstacles.			
21LGCE	Air Navigation	Z,ZK	3
Earth - its shape, parameters and properties. Aeronautical charts and their use. Measuring time. Dead reckoning. Radionavigation aids. Global navigation satellite systems. Air traffic services routes and their design.			
21LGL1	Aviation English 1	Z	2
Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.			
21LGL2	Aviation English 2	KZ	2
Terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems.			
21LGVP	Legislation and Operational Regulations	ZK	4
Introduction into aviation regulations. The scope of international and national organizations in civil aviation. Analysis and interpretation of the ICAO Annexes 1-19, ICAO Docs. 4444, 7030, 8168. Introduction to the European Parliament and Council Regulation (EC), Commission Regulation (EU) and the Decisions of the Executive Director of EASA.			
21LMR1	Aircraft Engines 1	ZK	3
Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characterictics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.			
21LVYO	Human Performance and Limitations	ZK	3
Human performace & limitations, aptibility & competence, accident statistics, flight safety, basics of flight physiology, man & environment, breathing & circulation, sensory system, health & hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & learning, theory & model of human error, body rhythms & sleep, stress, fatigue, working methods.			
21MEOL	Meteorology	KZ	3
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospherical fronts. Atmospherical rainfall, origin fission. Turbulence. Powers causing wind. Cyclone and anticyclone. Gradient wind. Geostrofical and geocyklostrofical wind. Visibilities in air transport. Dangerous meteorological aspects. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological informations.			
21PAP	Flight Planning and Performance	Z,ZK	4
Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.			
21RELP	Air Traffic Control	Z,ZK	4
21RIBZ	Aviation Safety	KZ	2
The course contains topics related to the safety management and structure of the SMS. This includes a description of the SMS mechanisms and tools, used to ensure the safe operations. During the course, students are continuously working on the semestral assignment, which helps them to understand practical application of the SMS.			
21SBL1	Bachelor Thesis Seminar 1	Z	1
Types of thesis (review, applied research, basic research, thesis dealing with design proposals). Working with citation sources (citation sources, citation databases, citation styles, how to cite). Analyzing the state of the art (standards of research writing). Defining the limitations of the state of the art. Introduction to the thesis methodology.			
21SBL2	Bachelor Thesis Seminar 2	Z	1
Methodology of thesis writing (introduction, analysis of the current state, specification of the problem, objectives and hypotheses). Definition of materials and methods, approach to obtaining results, presentation and discussion of results, formulation of thesis conclusions. Basics of LaTeX, working with LaTeX and Word template.			
21SBL3	Bachelor Thesis Seminar 3	Z	1
Formal and graphic design of the thesis. Data collection and presentation, basic statistical reasoning, validation of results and designs. Achieving the objectives of the thesis and evaluation of hypothesis tests. Preparation of the presentation, principles of presentation of the thesis.			
21SLD	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.			
21SYLP	Airport Security	KZ	2
Definition of aviation security and unlawful acts against the civil aviation. Description of threats, risks, causes and goals of Security. Overview of national and international regulations and their relevance to airport security. Security control devices. Operational efficiency factors and related variables. Basic use of queueing theory and optimization tasks.			
21X31L	Project 1 LED	Z	2
21X32L	Project 2 LED	Z	2
21X33L	Project 3 LED	Z	2
21Y1AM	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).			

21Y1BS	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.			
21Y1LJ	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.			
21Y1LS	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.			
21Y1MP	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.			
21Y1OH	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.			
21Y1PC	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.			
21Y1RZ	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.			
21Y1SI	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.			
21Y1UL	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.			
21ZALD	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.			
21ZT	ATM Systems	ZK	2
The course introduces classical and modern facilities, systems and technologies designated for ATS. Student obtains knowledge of technical principles and solutions as far as communication, navigation and surveillance aviation systems are concerned.			
21ZYT1	Principles of Flight 1	Z,ZK	3
Aerodynamic drag, relation between drag and speed, streamline, boundary layer, formula of continuity, formula of Bernoulli, lift and drag, air flow and pressures around wing, angle of attack, reactions of wing in air flow, lift and drag of a wing and an aircraft, coefficient of lift and drag, critical angle of attack, wing with final span, induced drag, interference, devices for lift and drag increase.			
21ZYT2	Principles of Flight 2	Z,ZK	3
Static & dynamic longitudinal stability, neutral point, location of centre of gravity, static directional & lateral stability, dynamic directional & lateral stability, control pitch (longitudinal), yaw (directional) & roll (lateral), roll/yaw interaction, trimming, speed of sound, Mach number, compressibility, shock waves, critical Mach number, aerodynamic heating, operating limitations, manoeuvring envelope, gust-load diagram.			
22SELN	Air Accident Investigation	ZK	2
Introduction and legislation (ICAO, EU, Czechia) related to air accident investigation. Obligations arising from legislative requirements for individual States in the event of an air accident, investigation process. Air accident site (inspector's equipment, site security, personal protection, initial activities at the site, sketch, evidence, etc.). Aircraft and crew documentation. Final report (formalities, substantive content, contribution).			
22X31L	Project 1 LED	Z	2
22X32L	Project 2 LED	Z	2
22X33L	Project 3 LED	Z	2
23X31L	Project 1 LED	Z	2
23X32L	Project 2 LED	Z	2
23X33L	Project 3 LED	Z	2
23Y1EH	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.			
23Y1KB	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.			
23Y1KM	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.			
23Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
23Y1KY	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.			

23Y1MK	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.			
23Y1MU	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.			
23Y1OK	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.			
23Y1TP	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.			
23Y1VS	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

For updated information see http://bilakniha.cvut.cz/en/FF.html
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