Study plan

Name of study plan: TUL bak.prez.21/22

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

Name of the block: Compulsory courses
Minimal number of credits of the block: 120
The role of the block: Z

Code of the group: 2.S.BTUL 18/19
Name of the group: 2.sem.TUL bak.prez. (od) 18/19
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** *Ondřej Navrátil, Oldřich Hykš, Magdalena Hykšová, Tomáš Třasák, Olga Vraštilová* ***Ondřej Navrátil*** *Ondřej Navrátil (Gar.)*	Z,ZK	5	2P+3C+20B	L	z
11STAT	**Statistics** *Evženie Uglickich, Pavla Pecherková, Michal Matowicki, Pavel Provinský, Natálie Blahitka, Ivan Nagy* ***Pavla Pecherková*** *Evženie Uglickich (Gar.)*	Z,ZK	4	2P+2C+12B	L	z
18SAT	**Structural Analysis** *Daniel Kytýř, Jitka Řezníčková, Jan Vyčichl, Tomáš Doktor, Nela Krčmářová, Jan Falta, Jan Šleichrt Daniel Kytýř (Gar.)*	Z,ZK	4	2P+2C+14B	L	z
21ZEL2	**Electronics Basics 2** *Vít Fábera*	Z,ZK	4	2P+2C	L	z
21ZYL1	**Principles of Flight 1** ***Vladimír Machula***	Z,ZK	5	2P+2C+16B	L	z
14PRG	**Programming** *Jana Kaliková, Martin Fiala, Jan Krčál, Alena Plašilová, Jan Procházka, Lukáš Svoboda* ***Jana Kaliková*** *Jana Kaliková (Gar.)*	KZ	2	0P+2C+8B	L	z
21LL1	**Aircraft 1** ***Jakub Kraus***	KZ	3	2P+1C+10B	L	z
21ZALD	**Basics of Air Transport** *Jakub Hospodka, Tomáš Tlučhoř, Jiří Volt, Peter Olexa, Jan Slezáček, Jakub Trýb*	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=2.S.BTUL 18/19 Name=2.sem.TUL bak.prez. (od) 18/19

11CAL2	Calculus 2	Z,ZK	5
Indefinite integral, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Parametric description of regular k-dimensional surfaces in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems			
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			
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.			

21ZEL2	Electronics Basics 2	Z,ZK	4
Deeper knowledge of the theory of the electron. Static electricity, electrical conductivity and terminology. Production of electricity and the DC power source. DC Circuits. Electrical resistance, resistor and performance. Capacity and capacitor. Magnetism. Inductance and inductor. DC motors and generators. Theory AC, resistive, capacitive, inductive circuits. Transformers. Brushless motors and generators. Frequency filters.			
21ZYL1	Principles of Flight 1	Z,ZK	5
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.			
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).			
21LL1	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.			
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: 4.S.BTUL 19/20
Name of the group: 4.sem.TUL bak.prez. (od) 19/20
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 7 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
11MSP	**Modeling of Systems and Processes** *Bohumil Kovář, Lucie Kárná, Jana Kuklová* ***Jana Kuklová*** *Bohumil Kovář (Gar.)*	Z,ZK	4	2P+2C+12B	L	z
11ELMO	**Electromagnetic Field and Optics** *Oldřich Hykš, Tomáš Vítů, Zuzana Malá* ***Zuzana Malá*** *Tomáš Vítů (Gar.)*	Z,ZK	5	2P+2C	L	z
21LOUL	**Aviation Maintenance Human Factors**	Z,ZK	6	3P+2C	L	z
21TML2	**Technology and Materials for Aviation 2**	Z,ZK	5	2P+2C	L	z
21DKL	**Aviation Data Link Communication** *Vladimír Machula, Jakub Steiner, Stanislav Pleninger*	KZ	3	2P+1C	L	z
21PYU1	**Aircraft Maintenance Technology 1**	KZ	4	2P+2C	L	z
15JZ2A	**Foreign Language - English 2** *Dana Boušová, Marie Michlová, Věra Pastorková, Jan Feit, Eva Rezlerová, Jitka Heřmanová, Markéta Musilová, Markéta Vojanová, Peter Morpuss, ...*	Z,ZK	3	0P+4C+10B		z

Characteristics of the courses of this group of Study Plan: Code=4.S.BTUL 19/20 Name=4.sem.TUL bak.prez. (od) 19/20

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.			
11ELMO	Electromagnetic Field and Optics	Z,ZK	5
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			
21LOUL	Aviation Maintenance Human Factors	Z,ZK	6
Assessment of aviation accident statistics. Analysis of failure chains. Human factors analytical and clasificatory systems. Risk management.			
21TML2	Technology and Materials for Aviation 2	Z,ZK	5
Transfers, overview and distribution; mechanical transmissions; part of transfers; gear ratio; shaft and bearing designs and materials; Gears; gear materials; gearboxes. Screw, riveted, welded, soldered and glued joints, their construction and production technology. Torque transmission components. Bearing of smooth parts and threads. Bearings, bearing mounting.			
21DKL	Aviation Data Link Communication	KZ	3
21PYU1	Aircraft Maintenance Technology 1	KZ	4
Basics of aircraft maintenance technology, legislation, aircraft release into operation, safety, equipment.			
15JZ2A	Foreign Language - English 2	Z,ZK	3
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			

Code of the group: 5.S.BTUL 19/20
Name of the group: 5.sem.TUL bak.prez.(od) 19/20
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 6 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
21LLG1	**Aviation Legislation 1** *Jiří Ďuk **Jiří Ďuk***	Z,ZK	4	2P+1C	Z	z
21KSY1	**Aircraft Construction and Systems 1** *Kateřina Stuchlíková, Karel Mündel **Karel Mündel***	Z,ZK	7	4P+3C	Z	z
21ZLS	**ATM Systems** *Vladimír Machula **Vladimír Machula***	Z,ZK	5	2P+2C	Z	z
21PYU2	**Aircraft Maintenance Technology 2** *Martin Novák **Martin Novák***	KZ	4	2P+2C	Z	z
21TUM1	**Turbine Engines 1** *Jakub Kraus, Ondřej Vítovec, Daniel Hanus **Daniel Hanus***	KZ	7	3P+3C	Z	z
21ATL1	**English 1 for Aviation for Specialization Technology of Aviation Maintenance** *Jitka Heřmanová **Jitka Heřmanová***	Z	3	0P+4C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5.S.BTUL 19/20 Name=5.sem.TUL bak.prez.(od) 19/20

21LLG1	Aviation Legislation 1	Z,ZK	4
Introduction to aviation legislation. Sphere of action of the CAA, ICAO, EASA. Part M and ML (continuing airworthiness), maintenance programmes, ADs, airworthiness reviews. Part 21 (initial airworthiness), design and production of aircraft.			
21KSY1	Aircraft Construction and Systems 1	Z,ZK	7
Aircraft construction requirements and functions - fuselage, wings, flight controls, undercarriage, aircraft pylon, nacelle. Aircraft systems requirements and functions - drainage, water distribution systems and aircraft ligthing.			
21ZLS	ATM Systems	Z,ZK	5
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.			
21PYU2	Aircraft Maintenance Technology 2	KZ	4
Classification, maintenance, checks and repair of construction parts - joints, bearing, hoses, pipes, gearing, brakes, dampers, shaft, springs.			
21TUM1	Turbine Engines 1	KZ	7
First part of the course is focused on the explanation and description of the purpose, operation and construction characteristics of aircraft turbojet and turbofan engines. Thermal engine, thermal cycle and its basic parameters, power output and thermal efficiency, basic construction modules, operational and construction characteristics.			
21ATL1	English 1 for Aviation for Specialization Technology of Aviation Maintenance	Z	3

Code of the group: 6.S.BTUL 19/20
Name of the group: 6.sem.TUL bak.prez.(od) 19/20
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 6 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
21ATL2	**English 2 for Aviation for Specialization Technology of Aviation Maintenance** *Jitka Heřmanová*	Z,ZK	3	0P+4C	L	z
21LLG2	**Aviation Legislation 2** *Jiří Ďuk **Jiří Ďuk***	ZK	2	2P+0C	L	z
21KSY2	**Aircraft Construction and Systems 2** *Karel Mündel*	Z,ZK	7	4P+3C	L	z
21TUM2	**Turbine Engines 2** *Kateřina Stuchlíková, Daniel Hanus, Tomáš Hejna*	Z,ZK	7	3P+3C	L	z
21V	**Aircraft Propellers** *Martin Novák Martin Novák (Gar.)*	Z,ZK	6	3P+2C	L	z
21PYU3	**Aircraft Maintenance Technology 3** *Pavol Hajla*	KZ	5	2P+2C	L	z

Characteristics of the courses of this group of Study Plan: Code=6.S.BTUL 19/20 Name=6.sem.TUL bak.prez.(od) 19/20

21ATL2	English 2 for Aviation for Specialization Technology of Aviation Maintenance	Z,ZK	3
21LLG2	Aviation Legislation 2	ZK	2
Commission regulation (EU) 1321/2014, Part 66, Part 145, Part 147, Part CAMO, Part CAO, Commission regulation (EU) 965/2012			
21KSY2	Aircraft Construction and Systems 2	Z,ZK	7
Aircraft systems requirements and functions - air condition, pressurization, oxygen systems, tyres, hydraulics, fuel systems, electrical systems, deicing system, fire protection system.			
21TUM2	Turbine Engines 2	Z,ZK	7
Second part of the course is focused on the explanation and description of the purpose, operation and construction characteristics of following aircraft turbine engines utility systems - lubrication system, cooling and internal air systems, fuel systems, starting and ignition, controls and instrumentation. Purpose, operation principles and construction schemes of turboprop engines, turboshaft and auxiliary power units.			

21V	Aircraft Propellers	Z,ZK	6
Theory of propeller blade, propeller load, propeller construction, control of blade angle, de-icing system, maintenance and repair of propellers.			
21PYU3	Aircraft Maintenance Technology 3	KZ	5
Particular technologies - diagnostics, surface treatments, airframe production, airframe jointing / bonding, sandwich construction, composite construction.			

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 60
The role of the block: P

Code of the group: 1.S.BTUL 20/21
Name of the group: 1.sem.TUL bak.prez.(od) 20/21
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
11CAL1	**Calculus 1** *Ondřej Navrátil, Magdalena Hykšová, Tomáš Třasák, Olga Vraštilová, Bohumil Kovář **Bohumil Kovář** Ondřej Navrátil (Gar.)*	Z,ZK	7	2P+4C+22B	Z	P
11LA	**Linear Algebra** *Pavel Provinský, Lucie Kárná, Martina Bečvářová **Martina Bečvářová** Martina Bečvářová (Gar.)*	Z,ZK	3	2P+1C+10B	Z	P
12ZYDI	**Introduction to Transportation Engineering** *Vojtěch Novotný, Zuzana Čarská, Dagmar Kočárková*	Z,ZK	2	1P+1C	Z	P
21ZEL1	**Electronics Basics 1** *Vít Fábera **Vít Fábera***	Z,ZK	5	3P+2C	Z	P
11GIE	**Geometry** *Oldřich Hykš, Pavel Provinský, Šárka Voráčová **Oldřich Hykš** Oldřich Hykš (Gar.)*	KZ	3	2P+2C+12B	Z	P
14KSP	**Constructing with Computer Aid** *Martin Fiala, Lukáš Svoboda, Martin Brumovský, Radek Kratochvíl, Jan Vogl, Drahomír Schmidt **Lukáš Svoboda** Drahomír Schmidt (Gar.)*	KZ	2	0P+2C+8B	Z	P
21ZLKO	**Basics of Aircraft Structures and Systems**	KZ	5	2P+2C	Z	P
16UDOP	**Introduction into Vehicles** *Zuzana Radová, Petr Bouchner*	Z	2	2P+0C+8B	Z	P
TV-1	**Physical Education**	Z	1		Z	P

Characteristics of the courses of this group of Study Plan: Code=1.S.BTUL 20/21 Name=1.sem.TUL bak.prez.(od) 20/21

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. Geometric properties of n-dimensional Euklidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.			
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.			
21ZEL1	Electronics Basics 1	Z,ZK	5
Electron theory. Static electricity, electrical conductivity and terminology. Production of electricity and the DC power source. DC Circuits. Electrical resistance, resistor and performance. Capacity and capacitor. Magnetism. Inductance and inductor. DC motors and generators. Theory AC, resistive, capacitive, inductive circuits. Transformers. Brushless motors and generators. Frequency filters.			
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.			
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).			
21ZLKO	Basics of Aircraft Structures and Systems	KZ	5
Basics of screening, technical drawing, technological and operational signs. Hydraulic, pneumatic, fuel, electricity and block diagrams in aviation.			
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: 3.S.BTUL 19/20

Name of the group: 3.sem.TUL bak.prez (od)19/20
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** *Oldřich Hykš, Jana Kuklová, Tomáš Vítů, Zuzana Malá* ***Zuzana Malá*** *Zuzana Malá (Gar.)*	Z,ZK	5	2P+2C+18B	Z	P
18PZP	**Elasticity and Strength** *Daniel Kytýř, Jitka Řezníčková, Jan Vyčichl, Tomáš Doktor, Nela Krčmářová, Jan Falta, Jan Šleichrt, Tomáš Fíla, Radim Dvořák, ...*	Z,ZK	3	2P+1C+10B	Z	P
21LCM	**Aircraft Engines** *Daniel Hanus, Tomáš Parýzek* ***Daniel Hanus***	Z,ZK	3	2P+1C	Z,L	P
21LTA2	**Aircraft 2** *Karel Mündel* ***Karel Mündel***	Z,ZK	2	2P+1C	Z	P
21ZYL2	**Principles of Flight 2** *Přemysl Vávra, Marek Veselý* ***Přemysl Vávra***	Z,ZK	5	2P+2C	Z	P
21TML1	**Technology and Materials for Aviation 1** *Jitka Řezníčková, Jaroslav Valach, Václav Rada* ***Jitka Řezníčková***	KZ	3	2P+1C	Z	P
21ZLEN	**Basic Electronics** *Vít Fábera* ***Vít Fábera***	KZ	6	2P+2C	Z	P
15JZ1A	**Foreign Language - English 1** *Dana Bousová, Marie Michlová, Jan Feit, Eva Rezlerová, Jitka Heřmanová, Markéta Musilová, Markéta Vojanová, Peter Morpuss, Lenka Monková, ...*	Z	3	0P+4C+10B	Z	P

Characteristics of the courses of this group of Study Plan: Code=3.S.BTUL 19/20 Name=3.sem.TUL bak.prez (od)19/20

11FYZ	Physics	Z,ZK	5
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
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.			
21LCM	Aircraft Engines	Z,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.			
21LTA2	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.			
21ZYL2	Principles of Flight 2	Z,ZK	5
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.			
21TML1	Technology and Materials for Aviation 1	KZ	3
Materials and society, energy and ecology. Basics of thermodynamics of metals and their alloys. Common materials for airplane design.			
21ZLEN	Basic Electronics	KZ	6
The subject is focused on switching elements, operational amplifier, generation harmonic and nonharmonic signals, sources, conduction of high fregvencies signals. Analog-Digital and Digital-Analog convertor.			
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.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
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. Geometric properties of n-dimensional Euklidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.			
11CAL2	Calculus 2	Z,ZK	5
Indefinite integral, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Parametric description of regular k-dimensional surfaces in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems			
11ELMO	Electromagnetic Field and Optics	Z,ZK	5
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			

11FYZ	Physics	Z,ZK	5
	Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.		
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.		
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		
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.		
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).		
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).		
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.		
15JZ2A	Foreign Language - English 2	Z,ZK	3
	Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.		
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.		
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.		
21ATL1	English 1 for Aviation for Specialization Technology of Aviation Maintenance	Z	3
21ATL2	English 2 for Aviation for Specialization Technology of Aviation Maintenance	Z,ZK	3
21DKL	Aviation Data Link Communication	KZ	3
21KSY1	Aircraft Construction and Systems 1	Z,ZK	7
	Aircraft construction requirements and functions - fuselage, wings, flight controls, undercarriage, aircraft pylon, nacelle. Aircraft systems requirements and functions - drainage, water distribution systems and aircraft ligthing.		
21KSY2	Aircraft Construction and Systems 2	Z,ZK	7
	Aircraft systems requirements and functions - air condition, pressurization, oxygen systems, tyres, hydraulics, fuel systems, electrical systems, deicing system, fire protection system.		
21LCM	Aircraft Engines	Z,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.		
21LL1	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.		
21LLG1	Aviation Legislation 1	Z,ZK	4
	Introduction to aviation legislation. Sphere of action of the CAA, ICAO, EASA. Part M and ML (continuing airworthiness), maintenance programmes, ADs, airworthiness reviews. Part 21 (initial airworthiness), design and production of aircraft.		
21LLG2	Aviation Legislation 2	ZK	2
	Commission regulation (EU) 1321/2014, Part 66, Part 145, Part 147, Part CAMO, Part CAO, Commission regulation (EU) 965/2012		
21LOUL	Aviation Maintenance Human Factors	Z,ZK	6
	Assessment of aviation accident statistics. Analysis of failure chains. Human factors analytical and clasificatory systems. Risk management.		
21LTA2	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.		
21PYU1	Aircraft Maintenance Technology 1	KZ	4
	Basics of aircraft maintenance technology, legislation, aircraft release into operation, safety, equipment.		
21PYU2	Aircraft Maintenance Technology 2	KZ	4
	Classification, maintenance, checks and repair of construction parts - joints, bearing, hoses, pipes, gearing, brakes, dampers, shaft, springs.		

21PYU3	Aircraft Maintenance Technology 3	KZ	5
Particular technologies - diagnostics, surface treatments, airframe production, airframe jointing / bonding, sandwich construction, composite construction.			
21TML1	Technology and Materials for Aviation 1	KZ	3
Materials and society, energy and ecology. Basics of thermodynamics of metals and their alloys. Common materials for airplane design.			
21TML2	Technology and Materials for Aviation 2	Z,ZK	5
Transfers, overview and distribution; mechanical transmissions; part of transfers; gear ratio; shaft and bearing designs and materials; Gears; gear materials; gearboxes. Screw, riveted, welded, soldered and glued joints, their construction and production technology. Torque transmission components. Bearing of smooth parts and threads. Bearings, bearing mounting.			
21TUM1	Turbine Engines 1	KZ	7
First part of the course is focused on the explanation and description of the purpose, operation and construction characteristics of aircraft turbojet and turbofan engines. Thermal engine, thermal cycle and its basic parameters, power output and thermal efficiency, basic construction modules, operational and construction characteristics.			
21TUM2	Turbine Engines 2	Z,ZK	7
Second part of the course is focused on the explanation and description of the purpose, operation and construction characteristics of following aircraft turbine engines utility systems - lubrication system, cooling and internal air systems, fuel systems, starting and ignition, controls and instrumentation. Purpose, operation principles and construction schemes of turboprop engines, turboshaft and auxiliary power units.			
21V	Aircraft Propellers	Z,ZK	6
Theory of propeller blade, propeller load, propeller construction, control of blade angle, de-icing system, maintenance and repair of propellers.			
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.			
21ZEL1	Electronics Basics 1	Z,ZK	5
Electron theory. Static electricity, electrical conductivity and terminology. Production of electricity and the DC power source. DC Circuits. Electrical resistance, resistor and performance. Capacity and capacitor. Magnetism. Inductance and inductor. DC motors and generators. Theory AC, resistive, capacitive, inductive circuits. Transformers. Brushless motors and generators. Frequency filters.			
21ZEL2	Electronics Basics 2	Z,ZK	4
Deeper knowledge of the theory of the electron. Static electricity, electrical conductivity and terminology. Production of electricity and the DC power source. DC Circuits. Electrical resistance, resistor and performance. Capacity and capacitor. Magnetism. Inductance and inductor. DC motors and generators. Theory AC, resistive, capacitive, inductive circuits. Transformers. Brushless motors and generators. Frequency filters.			
21ZLEN	Basic Electronics	KZ	6
The subject is focused on switching elements, operational amplifier, generation harmonic and nonharmonic signals, sources, conduction of high fregvencies signals. Analog-Digital and Digital-Analog convertor.			
21ZLKO	Basics of Aircraft Structures and Systems	KZ	5
Basics of screening, technical drawing, technological and operational signs. Hydraulic, pneumatic, fuel, electricity and block diagrams in aviation.			
21ZLS	ATM Systems	Z,ZK	5
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.			
21ZYL1	Principles of Flight 1	Z,ZK	5
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.			
21ZYL2	Principles of Flight 2	Z,ZK	5
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.			
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1

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