

Study plan

Name of study plan: bak.prez.10/11

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: 93

Elective courses credits: -3

Sum of credits in the plan: 90

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 87

The role of the block: Z

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

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

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 12 courses

Credits in the group: 30

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 13E | Economics | Z,ZK | 3 | 2+1 | Z | z |
| 11GIE | Geometry Šárka Vorá ová, Pavel Provinský, Old ich Hykš, Vít Malinovský Old ich Hykš Šárka Vorá ová (Gar.) | KZ | 3 | 2P+2C+12B | Z | z |
| 14KSP | Constructing with Computer Aid Lukáš Svoboda, Drahomír Schmidt, Martin Brumovský, Radek Kratochvíl, Vladimír Douda, Michal Mlada, Jan Vogl, Jan Zelenka Lukáš Svoboda | KZ | 2 | 0P+2C+8B | Z | z |
| 11LA | Linear Algebra Pavel Provinský, Martina Be vá ová, Lucie Kárná Martina Be vá ová | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 11MTA | Mathematical Analysis | Z,ZK | 4 | 2+2 | Z | z |
| 18MRI1 | Materials 1 | Z,ZK | 3 | 2+1 | Z | z |
| 00TVC1 | Physical Education 1 | Z | 1 | 0+2 | Z | z |
| 18TTED | Creation of Technical Documentation | KZ | 2 | 2+1 | Z | z |
| 22UN | Traffic Accidents Introduction | Z | 2 | 2+0 | Z | z |
| 12ZADI | Introduction to Transportation Engineering | Z,ZK | 3 | 2+1 | Z | z |
| 14ZINF | Fundamentals of Informatics | KZ | 2 | 0+2 | Z | z |
| 21ZLD | Introduction to Air Transport | KZ | 2 | 2+1 | Z | z |

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

| | | | | |
|-------|--------------------------------|------|---|--|
| 13E | Economics | Z,ZK | 3 | Microeconomic and macroeconomic interpretation of economic relations. Method and subject of the economics. Economic decision making of consumers and producers. Market structures. Labour and capital, efficiency, ownership, public choice. |
| 11GIE | Geometry | KZ | 3 | Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a 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 possibilities, AutoCAD environment profiles, drawings with raster foundations). |
| 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. |

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|--|--|------|---|
| 11MTA | Mathematical Analysis | Z,ZK | 4 |
| Sequences and series of real numbers and its convergence. Basic properties of functions. Differential and integral calculus of the real function of one real variable. Power series, Fourier series and foundations of Fourier transform. | | | |
| 18MRI1 | Materials 1 | Z,ZK | 3 |
| Crystal structure. Basics of thermodynamics of metals and their alloys. Balanced binary diagrams. Alloys of iron with carbon. Deterioration of solid solutions. Heating processing of steel and cast irons. Physical features. Mechanical features. Dephctostopic testing. Corosion. | | | |
| 00TVC1 | Physical Education 1 | Z | 1 |
| Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic. | | | |
| 18TTED | Creation of Technical Documentation | KZ | 2 |
| Technical standards, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets, types of schemes and their creation. | | | |
| 22UN | Traffic Accidents Introduction | Z | 2 |
| Traffic accident as a physical process, systematic submission, vehicle x human x infrastructure interaction, accidents statistics, aircraft accidents, accidents on railways, accidents on waterways, road traffic accidents, other aspects, accidental prevention. | | | |
| 12ZADI | Introduction to Transportation Engineering | Z,ZK | 3 |
| Traffic survey. Terrestrial roads. Residential zone. Land - use planning. Railway transport. Public mass transport. Integrated traffic systems. Traffic prognosis. Traffic safety. Air transport. Traffic and environment. | | | |
| 14ZINF | Fundamentals of Informatics | KZ | 2 |
| Introduction to faculty network, MS-Word and Open Office, use of styles and advanced features, computer functions and information transmission. Number systems incl. arithmetic calculations. Algorithms and their proprieties. Flow charts for algorithms drawing. Mathematic and logic ordering algorithms incl. functions and procedures. Work with MS-Excel - tables, graphs, calculations, functions. | | | |
| 21ZLD | Introduction to Air Transport | KZ | 2 |
| Air transport as a component of complex transport system. International status of civil aviation. International organizations in Europe and worldwide. Characteristics of air transport. Commercial air transport. Technical operations of aeroplanes. | | | |

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

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

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 12 courses

Credits in the group: 30

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|---|------------|---------|-------|----------|------|
| 13EDOT | Economy, Transport, Telecommunications | KZ | 2 | 2+0 | L | z |
| 11FY1 | Physics 1 | Z,ZK | 4 | 2P+2C | L | z |
| 11MVP | Mathematical Analysis of Function of More Variables | Z,ZK | 3 | 2+2 | L | z |
| 18MRI2 | Materials 2 | KZ | 2 | 2+0 | L | z |
| 11PT | Probability | Z | 2 | 1+1 | L | z |
| 12PKD | Rail Transport Designing | Z,ZK | 3 | 2+2 | L | z |
| 14SIAP | Networks and Protocols | KZ | 2 | 1+1 | L | z |
| 18ST | Statics | Z,ZK | 3 | 2+1 | L | z |
| 17TDL | Transport Technology and Logistics | Z,ZK | 3 | 2+2 | L | z |
| 00TVC2 | Physical Education 2 | Z | 1 | 0+2 | L | z |
| 20UIS | Introduction to ITS | Z,ZK | 3 | 2+1 | L | z |
| 14UPRO | Introduction to Programming | KZ | 2 | 0+2 | L | z |

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

| | | | |
|--|---|------|---|
| 13EDOT | Economy, Transport, Telecommunications | KZ | 2 |
| Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability. | | | |
| 11FY1 | Physics 1 | Z,ZK | 4 |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current. | | | |
| 11MVP | Mathematical Analysis of Function of More Variables | Z,ZK | 3 |
| Metric spaces, sequences in metric spaces, limit of sequence in metric space. Differential calculus of functions of several variables, differential of function, partial derivations, implicitly defined functions, extremes of functions of several variables. Integral calculus of functions of several variables, Riemann integral, integral over curves and surfaces in R3, application of integral calculus in physics. | | | |
| 18MRI2 | Materials 2 | KZ | 2 |
| Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials. | | | |
| 11PT | Probability | Z | 2 |
| Descriptive statistics. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability distribution, probability mass and density, moments, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. Mixed distributions, mixture of distributions. Law of large numbers, central limit theorem. | | | |

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|--|------------------------------------|------|---|
| 12PKD | Rail Transport Designing | Z,ZK | 3 |
| Railway lines network. Vehicle and track relation. Traction. Track geometrical parameters. Clearance profile. Railway lines routing. Superstructure and substructure of the railway lines. Switches. Railway stations. City rail transport. | | | |
| 14SIAP | Networks and Protocols | KZ | 2 |
| Basic communication model, history and development of the Internet, principle of data transfer through computer networks (TCP/IP), performance of basic network protocols (ARP, RARP, TCP, UDP, Telnet, FTP, DNS, DHCP POP3, IMAP), data acquirment from the Internet sources, communicating ability via the Internet and fundamentals of own web presentation design by the means of web sites. | | | |
| 18ST | Statics | Z,ZK | 3 |
| General system of forces. Calculation of reactions of mass objects and compound systems. Assessment of internal forces on statically determinate beam and simple framework. Principle of virtual works. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction, method of joints and method of sections. Geometry of cross sections. Plane fiber polygons and catenary cables. | | | |
| 17TDL | Transport Technology and Logistics | Z,ZK | 3 |
| Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in pasanger and freight transport. Organisation of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city transport. Logistic technologies and their application using various transport means. | | | |
| 00TVC2 | Physical Education 2 | Z | 1 |
| Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic. | | | |
| 20UIS | Introduction to ITS | Z,ZK | 3 |
| Intelligent Transport Systems (ITS), their objectives and vision. ITS in the world, in Europe and in the Czech Republic. Architecture of ITS and the role of standardization. Information and navigation systems. ITS in road, rail and combine transport. Design of ITS, organization, preparation and implementation of the project. Current projects in the Czech Republic. | | | |
| 14UPRO | Introduction to Programming | KZ | 2 |
| Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity. | | | |

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

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

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

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

Credits in the group: 27

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 11DAD | Differential and Difference Equations | Z,ZK | 3 | 2+1 | Z | z |
| 11FY2 | Physics 2 | Z,ZK | 4 | 2+2 | Z | z |
| 12MDE | Transport Models and Transport Excesses <i>Josef Kocourek, Milan Dont</i> | Z,ZK | 3 | 2P+1C+8B | Z | z |
| 12PPOK | Designing Roads, Highways and Motorways <i>Petr Šatra, Jiří arský, Tomáš Padělek, Petr Kumpošt</i> | KZ | 3 | 1P+2C+10B | Z | z |
| 18PZP | Elasticity and Strength <i>Ondřej Jiroušek, Josef Jíra, Petr Koudelka, Jitka Ježníková, Daniel Kytý, Jan Vyšehradský, Tomáš Doktor, Jan Šleicher, Radim Dvořák</i> | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 11SIS | Statistics | Z,ZK | 2 | 1+1 | Z | z |
| 20SSA | Systems Analysis | Z,ZK | 3 | 2+1 | Z | z |
| 14UATT | Introduction to Automatization and Telecommunication Systems | KZ | 2 | 3+0 | Z | z |
| 16UDDM | Introduction to Transportation and Manipulation Technics | ZK | 2 | 2+0 | Z | z |
| 14ZAET | Fundamentals of Electrotechnics | KZ | 2 | 2+1 | Z | z |

Characteristics of the courses of this group of Study Plan: Code=3.S.BP 11/12 Name=3.sem.bak.prez.11/12

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|--|---|------|---|
| 11DAD | Differential and Difference Equations | Z,ZK | 3 |
| Difference equations and its systems. Some solvable types of differential equations of the first order. Linear differential equations of the n-th order. Methods for solution of the homogeneous equation, solution of inhomogeneous equation by means of variation of constants. Power series and their use for solution of differential equation. Boundary value problem. Eigennumbers and function for differential equation. Fourier series of function. | | | |
| 11FY2 | Physics 2 | Z,ZK | 4 |
| Magnetic field, electromagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-electron atoms, the nuclei. Basics of solid body physics. | | | |
| 12MDE | Transport Models and Transport Excesses | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. 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. | | | |

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|---|--|------|---|
| 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. | | | |
| 11SIS | Statistics | Z,ZK | 2 |
| Point estimation, properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression, use of matrices in regression. | | | |
| 20SSA | Systems Analysis | Z,ZK | 3 |
| Systems identification. Typical tasks of systems analysis: on the interface, routes in system, decomposition and integration, on systems feedback. Capacity tasks, process analysis. Task about behaviour, aim behaviour, the genetic code, architecture and identity of systems. Fundamentals of technical cybernetics, stability and reliability of systems. | | | |
| 14UATT | Introduction to Automatization and Telecommunication Systems | KZ | 2 |
| Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transportation, modelling and projecting of transport systems, integrated technological and information system in post, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedia networks and services, NGN networks. | | | |
| 16UDDM | Introduction to Transportation and Manipulation Technics | ZK | 2 |
| Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislation. | | | |
| 14ZAET | Fundamentals of Electrotechnics | KZ | 2 |
| Basic electrotechnic terms, circuit quantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assignating of bipoles and basic circuit elements. Solution to direct current circuits with a help of circuit analysis elementary methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triangular and principle of superposition in direct current circuits. | | | |

Name of the block: Jazyky

Minimal number of credits of the block: 6

The role of the block: J

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

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

Requirement credits in the group: In this group you have to gain 6 credits

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

Credits in the group: 6

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|--|------------|---------|-----------|----------|------|
| 15JZ1A | Foreign Language - English 1 Markéta Vojanová, Jitka He manová, Marek Tomek, Marie Michlová, Lenka Monková, Markéta Musilová, Peter Morpuss, Jan Feit, Eva Rezlerová | Z | 3 | 0P+4C+10B | Z | J |
| 15JZ2A | Foreign Language - English 2 Markéta Vojanová, Jitka He manová, Marek Tomek, Marie Michlová, Lenka Monková, Markéta Musilová, Peter Morpuss, Jan Feit, Eva Rezlerová | Z,ZK | 3 | 0P+4C+10B | | J |
| 15JZ1F | Foreign Language - French 1 | Z | 3 | 0+4 | Z | J |
| 15JZ2F | Foreign Language - French 2 | Z,ZK | 3 | 0+4 | L | J |
| 15JZ1N | Foreign Language - German 1 | Z | 3 | 0+4 | Z | J |
| 15JZ2N | Foreign Language - German 2 | Z,ZK | 3 | 0+4 | L | J |
| 15JZ1R | Foreign Language - Russian 1 | Z | 3 | 0+4 | Z | J |
| 15JZ2R | Foreign Language - Russian 2 | Z,ZK | 3 | 0+4 | L | J |
| 15JZ1S | Foreign Language - Spanish 1 | Z | 3 | 0+4 | Z | J |
| 15JZ2S | Foreign Language - Spanish 2 | Z,ZK | 3 | 0+4 | L | J |

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

| | | | |
|--|------------------------------|------|---|
| 15JZ1A | Foreign Language - English 1 | Z | 3 |
| Grammatical 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. | | | |
| 15JZ1F | Foreign Language - French 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ2F | Foreign Language - French 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |

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|--|------------------------------|------|---|
| 15JZ1N | Foreign Language - German 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ2N | Foreign Language - German 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ1R | Foreign Language - Russian 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ2R | Foreign Language - Russian 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ1S | Foreign Language - Spanish 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ2S | Foreign Language - Spanish 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|--|---|------------|---------|
| 00TVC1 | Physical Education 1 | Z | 1 |
| Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic. | | | |
| 00TVC2 | Physical Education 2 | Z | 1 |
| Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic. | | | |
| 11DAD | Differential and Difference Equations | Z,ZK | 3 |
| Difference equations and its systems. Some solvable types of differential equations of the first order. Linear differential equations of the n-th order. Methods for solution of the homogeneous equation, solution of inhomogeneous equation by means of variation of constants. Power series and their use for solution of differential equation. Boundary value problem. Eigennumbers and function for differential equation. Fourier series of function. | | | |
| 11FY1 | Physics 1 | Z,ZK | 4 |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current. | | | |
| 11FY2 | Physics 2 | Z,ZK | 4 |
| Magnetic field, electromagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-electron atoms, the nuclei. Basics of solid body physics. | | | |
| 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. | | | |
| 11MTA | Mathematical Analysis | Z,ZK | 4 |
| Sequences and series of real numbers and its convergence. Basic properties of functions. Differential and integral calculus of the real function of one real variable. Power series, Fourier series and foundations of Fourier transform. | | | |
| 11MVP | Mathematical Analysis of Function of More Variables | Z,ZK | 3 |
| Metric spaces, sequences in metric spaces, limit of sequence in metric space. Differential calculus of functions of several variables, differential of function, partial derivations, implicitly defined functions, extremes of functions of several variables. Integral calculus of functions of several variables, Riemann integral, integral over curves and surfaces in R^3 , application of integral calculus in physics. | | | |
| 11PT | Probability | Z | 2 |
| Descriptive statistics. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability distribution, probability mass and density, moments, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. Mixed distributions, mixture of distributions. Law of large numbers, central limit theorem. | | | |
| 11SIS | Statistics | Z,ZK | 2 |
| Point estimation, properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression, use of matrices in regression. | | | |

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|---|--|------|---|
| 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. | | | |
| 12PKD | Rail Transport Designing | Z,ZK | 3 |
| Railway lines network. Vehicle and track relation. Traction. Track geometrical parameters. Clearance profile. Railway lines routing. Superstructure and substructure of the railway lines. Switches. Railway stations. City rail transport. | | | |
| 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. | | | |
| 12ZADI | Introduction to Transportation Engineering | Z,ZK | 3 |
| Traffic survey. Terrestrial roads. Residential zone. Land - use planning. Railway transport. Public mass transport. Integrated traffic systems. Traffic prognosis. Traffic safety. Air transport. Traffic and environment. | | | |
| 13E | Economics | Z,ZK | 3 |
| Microeconomic and macroeconomic interpretation of economic relations. Method and subject of the economics. Economic decision making of consumers and producers. Market structures. Labour and capital, efficiency, ownership, public choice. | | | |
| 13EDOT | Economy, Transport, Telecommunications | KZ | 2 |
| Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability. | | | |
| 14KSP | Constructing with Computer Aid | KZ | 2 |
| "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations). | | | |
| 14SIAP | Networks and Protocols | KZ | 2 |
| Basic communication model, history and development of the Internet, principle of data transfer through computer networks (TCP/IP), performance of basic network protocols (ARP, RARP, TCP, UDP, Telnet, FTP, DNS, DHCP POP3, IMAP), data acquirement from the Internet sources, communicating ability via the Internet and fundamentals of own web presentation design by the means of web sites. | | | |
| 14UATT | Introduction to Automatization and Telecommunication Systems | KZ | 2 |
| Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transportation, modelling and projecting of transport systems, integrated technological and information system in post, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedial networks and services, NGN networks. | | | |
| 14UPRO | Introduction to Programming | KZ | 2 |
| Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity. | | | |
| 14ZAET | Fundamentals of Electrotechnics | KZ | 2 |
| Basic electrotechnic terms, circuit quantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assignating of bipoles and basic circuit elements. Solution to direct current circuits with a help of circuit analysis elementary methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triangel and principle of superposition in direct current circuits. | | | |
| 14ZINF | Fundamentals of Informatics | KZ | 2 |
| Introduction to faculty network, MS-Word and Open Office, use of styles and advanced features, computer functions and information transmission. Number systems incl. arithmetic calculations. Algorithms and their properties. Flow charts for algorithms drawing. Mathematic and logic ordering algorithms incl. functions and procedures. Work with MS-Excel - tables, graphs, calculations, functions. | | | |
| 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. | | | |
| 15JZ1F | Foreign Language - French 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ1N | Foreign Language - German 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ1R | Foreign Language - Russian 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ1S | Foreign Language - Spanish 1 | Z | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 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. | | | |
| 15JZ2F | Foreign Language - French 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |

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| 15JZ2N | Foreign Language - German 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ2R | Foreign Language - Russian 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 15JZ2S | Foreign Language - Spanish 2 | Z,ZK | 3 |
| Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation. | | | |
| 16UDDM | Introduction to Transportation and Manipulation Technics | ZK | 2 |
| Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislature. | | | |
| 17TDL | Transport Technology and Logistics | Z,ZK | 3 |
| Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in passenger and freight transport. Organisation of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city transport. Logistic technologies and their application using various transport means. | | | |
| 18MRI1 | Materials 1 | Z,ZK | 3 |
| Crystal structure. Basics of thermodynamics of metals and their alloys. Balanced binary diagrams. Alloys of iron with carbon. Deterioration of solid solutions. Heating processing of steel and cast irons. Physical features. Mechanical features. Dephctostopic testing. Corosion. | | | |
| 18MRI2 | Materials 2 | KZ | 2 |
| Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials. | | | |
| 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. | | | |
| 18ST | Statics | Z,ZK | 3 |
| General system of forces. Calculation of reactions of mass objects and compound systems. Assessment of internal forces on statically determinate beam and simple framework. Principle of virtual works. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction, method of joints and method of sections. Geometry of cross sections. Plane fiber polygons and catenary cables. | | | |
| 18TTED | Creation of Technical Documentation | KZ | 2 |
| Technical standards, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets, types of schemes and their creation. | | | |
| 20SSA | Systems Analysis | Z,ZK | 3 |
| Systems identification. Typical tasks of systems analysis: on the interface, routes in system, decomposition and integration, on systems feedback. Capacity tasks, process analysis. Task about behaviour, aim behaviour, the genetic code, architecture and identity of systems. Fundamentals of technical cybernetics, stability and reliability of systems. | | | |
| 20UIS | Introduction to ITS | Z,ZK | 3 |
| Intelligent Transport Systems (ITS), their objectives and vision. ITS in the world, in Europe and in the Czech Republic. Architecture of ITS and the role of standardization. Information and navigation systems. ITS in road, rail and combine transport. Design of ITS, organization, preparation and implementation of the project. Current projects in the Czech Republic. | | | |
| 21ZLD | Introduction to Air Transport | KZ | 2 |
| Air transport as a component of complex transport system. International status of civil aviation. International organizations in Europe and worldwide. Characteristics of air transport. Commercial air transport. Technical operations of aeroplanes. | | | |
| 22UN | Traffic Accidents Introduction | Z | 2 |
| Traffic accident as a physical process, systematic submission, vehicle x human x infrastructure interaction, accidents statistics, aircraft accidents, accidents on railways, accidents on waterways, road traffic accidents, other aspects, accidental prevention. | | | |

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

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