# Study plan

## Name of study plan: 1.r. KOMBI studium (od ZS 11-12), od 2.r. PRE MED studium dále

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:

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Name of the block: Compulsory courses
Minimal number of credits of the block: 156
The role of the block: Z

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Code of the group: 1S KOMBI 11-12 P
Name of the group: 1. sem. KOMBI 11-12 povinné předměty (jen obor MED)
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 |
|---|---|---|---|---|---|---|
| 613E | **Economics** | Z,ZK | 3 | 2+1 | Z | z |
| 611GIE | **Geometry** *Vít Malinovský* | KZ | 3 | 2P+2C+12B | Z | z |
| 614KSP | **Constructing with Computer Aid** *Libor Žídek* | KZ | 2 | 0P+2C+8B | Z | z |
| 611LA | **Linear Algebra** *Romana Zibnerová* | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 611MTA | **Mathematical Analysis** | Z,ZK | 4 | 2+2 | Z | z |
| 618MRI1 | **Materials 1** | Z,ZK | 3 | 2+1 | Z | z |
| 618TTED | **Creation of Technical Documentation** | KZ | 2 | 2+1 | Z | z |
| 622UN | **Traffic Accidents Introduction** | Z | 2 | 2+0 | Z | z |
| 612ZADI | **Introduction to Transportation Engineering** | Z,ZK | 3 | 2+1 | Z | z |
| 614ZINF | **Fundamentals of Informatics** | KZ | 2 | 0+2 | Z | z |
| 621ZLDK | **Introduction to Air Transport** | KZ | 3 | 8 | Z | z |

**Characteristics of the courses of this group of Study Plan: Code=1S KOMBI 11-12 P Name=1. sem. KOMBI 11-12 povinné předměty (jen obor MED)**

| | | | |
|---|---|---|---|
| 613E | Economics | Z,ZK | 3 |
| 611GIE | Geometry | KZ | 3 |
| Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet`s trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path. | | | |
| 614KSP | Constructing with Computer Aid | KZ | 2 |
| "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilites, AutoCAD environment profiles, drawings with raster foundaments). | | | |
| 611LA | Linear Algebra | Z,ZK | 3 |
| Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification. | | | |
| 611MTA | 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. | | | |

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|---|---|---|---|
| 618MRI1 | 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. Dephectostopic testing. Corosion. | | | |
| 618TTED | 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. | | | |
| 622UN | Traffic Accidents Introduction | Z | 2 |
| 612ZADI | 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. | | | |
| 614ZINF | 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. | | | |
| 621ZLDK | Introduction to Air Transport | KZ | 3 |
| 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: 2S KOMBI 11-12 P
Name of the group: 2. sem. KOMBI 11-12 povinné předměty (obor MED)
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 |
|---|---|---|---|---|---|---|
| 613EDOT | **Economy, Transport, Telecommunications** | KZ | 2 | | L | z |
| 611FY1 | **Physics 1** | Z,ZK | 4 | 2+2 | L | z |
| 611MVP | **Mathematical Analysis of Function of More Variables** | Z,ZK | 3 | 2+2 | L | z |
| 618MRI2 | **Materials 2** | KZ | 2 | 2+0 | L | z |
| 611PT | **Probability** | Z | 2 | 1+1 | L | z |
| 612PKD | **Rail Transport Designing** | Z,ZK | 3 | 2+2 | L | z |
| 614SIAP | **Networks and Protocols** | KZ | 2 | 1+1 | L | z |
| 618ST | **Statics** | Z,ZK | 3 | 2+1 | L | z |
| 617TDLK | **Transport Technology and Logistics** | Z,ZK | 4 | 12 | L | z |
| 620UIS | **Introduction to ITS** | Z,ZK | 3 | 2+1 | L | z |
| 614UPRO | **Introduction to Programming** | KZ | 2 | 0+2 | L | z |

**Characteristics of the courses of this group of Study Plan: Code=2S KOMBI 11-12 P Name=2. sem. KOMBI 11-12 povinné předměty (obor MED)**

| | | | |
|---|---|---|---|
| 613EDOT | Economy, Transport, Telecommunications | KZ | 2 |
| 611FY1 | Physics 1 | Z,ZK | 4 |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current. | | | |
| 611MVP | 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. | | | |
| 618MRI2 | Materials 2 | KZ | 2 |
| Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials. | | | |
| 611PT | 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. | | | |
| 612PKD | 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. | | | |
| 614SIAP | 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. | | | |
| 618ST | 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. | | | |

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|---|---|---|---|
| 617TDLK | Transport Technology and Logistics | Z,ZK | 4 |
| 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. | | | |
| 620UIS | 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. | | | |
| 614UPRO | 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: 3S PRE 12-13 P
Name of the group: 3. sem. PRE 12-13 povinné předměty (spol. část studia)
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<br>*(in case of groups of courses the list of codes of their members)*<br>*Tutors,* ***authors*** *and guarantors (gar.)* | Completion | Credits | Scope | Semester | Role |
|---|---|---|---|---|---|---|
| 611DAD | **Differential and Difference Equations** | Z,ZK | 3 | 2+1 | Z | z |
| 611FY2 | **Physics 2** | Z,ZK | 4 | 2+2 | Z | z |
| 612MDE | **Transport Models and Transport Excesses**<br>*Josef Kocourek, Tomáš Padělek, Aneta Matysková* | Z,ZK | 3 | 2P+1C+8B | Z | z |
| 612PPOK | **Designing Roads, Highways and Motorways**<br>*Jiří Čarský, Petr Kumpošt* | KZ | 3 | 1P+2C+10B | Z | z |
| 618PZP | **Elasticity and Strength**<br>*Tomáš Doktor, Petr Koudelka, Radim Dvořák* | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 611SIS | **Statistics** | Z,ZK | 2 | 1+1 | Z | z |
| 620SSA | **Systems Analysis** | Z,ZK | 3 | 2+1 | Z | z |
| 614UATT | **Introduction to Automatization and Telecommunication Systems** | KZ | 2 | 3+0 | Z | z |
| 616UDDM | **Introduction to Transportation and Manipulation Technics** | ZK | 2 | 2+0 | Z | z |
| 614ZAET | **Fundamentals of Electrotechnics** | KZ | 2 | 2+1 | Z | z |

**Characteristics of the courses of this group of Study Plan: Code=3S PRE 12-13 P Name=3. sem. PRE 12-13 povinné předměty (spol. část studia)**

| | | | |
|---|---|---|---|
| 611DAD | Differential and Difference Equations | Z,ZK | 3 |
| Concept of a differential equation of the first order and some methods of its solution. Differential equations of the n-th order, linear diferential equations. Initial and boundary conditions for ordinary linear differential equation of the second order. Systems of linear differential equations. Difference equations, linear difference equations and their systems. | | | |
| 611FY2 | 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. | | | |
| 612MDE | Transport Models and Transport Excesses | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency. | | | |
| 612PPOK | Designing Roads, Highways and Motorways | KZ | 3 |
| Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections. | | | |
| 618PZP | Elasticity and Strength | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis. | | | |
| 611SIS | 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. | | | |
| 620SSA | 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. | | | |
| 614UATT | Introduction to Automatization and Telecommunication Systems | KZ | 2 |
| Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transpotation, modelling and projecting of transport systems, integrated technological and infromation system in post, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedial networks and services, NGN networks. | | | |
| 616UDDM | 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. | | | |

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|---|---|---|---|
| 614ZAET | 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 elementar methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triplangel and principle of superposition in direct current circuits.

Code of the group: 4S P MED 12-13 P
Name of the group: 4. sem. PRE MED 12-13 povinné předměty
Requirement credits in the group: In this group you have to gain 21 credits
Requirement courses in the group: In this group you have to complete 9 courses
Credits in the group: 21
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 |
|---|---|---|---|---|---|---|
| 617EM | **Management Science** | KZ | 2 | 2+0 | L | z |
| 613EDTP | **Economy and Management of Transport and Telecommunication Processes** | Z,ZK | 3 | 2+1 | L | z |
| 617GEDS | **Geography of Transport Systems** *Milan Kříž Milan Kříž (Gar.)* | KZ | 2 | 2P+0C+8B | L | z |
| 613HG | **Economic Geography** | Z | 2 | 2+0 | L | z |
| 618KIAD | **Kinematics and Dynamics** | Z,ZK | 2 | 2+1 | L | z |
| 613MVD | **Marketing in Transportation** | Z,ZK | 2 | | L | z |
| 617MEKA | **Methods of Economics Analysis** *Martina Vitteková* | KZ | 2 | 2P+0C+8B | Z | z |
| 611MSP | **Modeling of Systems and Processes** *Bohumil Kovář* | Z,ZK | 4 | 2P+2C+12B | L | z |
| 617RIP | **Project Management** | KZ | 2 | 2+0 | L | z |

**Characteristics of the courses of this group of Study Plan: Code=4S P MED 12-13 P Name=4. sem. PRE MED 12-13 povinné předměty**

| | | | |
|---|---|---|---|
| 617EM | Management Science | KZ | 2 |

Linear Programming, graphical interpretation and solution of LP problem. Types of distribution problems, transportation problem. Models of network analysis. Models of queuing theory. Models of inventory management. Simulation models.

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|---|---|---|---|
| 613EDTP | Economy and Management of Transport and Telecommunication Processes | Z,ZK | 3 |

Transport and telecommunication system, financing of transport infrastructure, transport policy, transport service, energy sources, public goods, externalities in transport and their treatment, assessment of public projects, CBA method, transport company, costing in transportation, transport quality.

| | | | |
|---|---|---|---|
| 617GEDS | Geography of Transport Systems | KZ | 2 |

Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction - theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographical analysis in transportation planning.

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|---|---|---|---|
| 613HG | Economic Geography | Z | 2 |

Introduction of the issues, definitions and introductory concepts. World geography and its research subject. Economic geography - Europe, Asia, Africa, Australia, America, the Czech Republic. Transport geography and its research subject. Characteristics of transportation as one of the branches of the global economy. Transport systems and their location in the world. Particular transport modes as part of the economy and the world transport system.

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| 618KIAD | Kinematics and Dynamics | Z,ZK | 2 |

Motion along a line, motion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point mass dynamics and system of point masses, equation of motion. Method of Newton. Princle of D´Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with multiple degrees of freedom.

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| 613MVD | Marketing in Transportation | Z,ZK | 2 |

General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.

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| 617MEKA | Methods of Economics Analysis | KZ | 2 |

The techniques of economical analysis in the domain of analysis of dependencies, analysis and construction of time series and comparsion of statistical values using differencies and indices.

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| 611MSP | Modeling of Systems and Processes | Z,ZK | 4 |

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

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|---|---|---|---|
| 617RIP | Project Management | KZ | 2 |

Project, influences, pressures and influences. Entrepreneurial plan and capital decision making. Marketing, break-even point assessment. Project management and his characters. Organizational structures in project management. Feasibility study. Capital and operational costs assessment. Process of choosing optimal variant. Cost Benefit Analysis. Models of project financing. Life cycle of project. Financial anal. of capital projects. Project risks.

Code of the group: 4S P MED 12-13 PV
Name of the group: 4. sem. PRE MED 12-13 povinné předměty-výběr
Requirement credits in the group: In this group you have to gain 2 credits
Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 2
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 |
|---|---|---|---|---|---|---|
| 614EAT | **Economic Analyses in Spreadsheets Programs Environment** | KZ | 2 | 0+2 | L | z |
| 614WS1 | **Webdesign With Web Standards 1** | KZ | 2 | 0+2 | L | z |

**Characteristics of the courses of this group of Study Plan: Code=4S P MED 12-13 PV Name=4. sem. PRE MED 12-13 povinné předměty-výběr**

| | | | |
|---|---|---|---|
| 614EAT | Economic Analyses in Spreadsheets Programs Environment | KZ | 2 |
| Work with spreadsheet programs with the respect to economic problems, use of nested functions and conditional formatting, statistic and mathematic functions. Creation of graphs and other graphic outputs. Data analysis, lists and contingent tables. | | | |
| 614WS1 | Webdesign With Web Standards 1 | KZ | 2 |
| HTTP, URL, markup languages HTML and XHTML, anchors, tables, images, lists, forms, features of CSS, rules of accessible web pages, usability of web pages, problems of different browsers, one, two and three column pages, page validation, conditional comments, CSS hacks. | | | |

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Code of the group: 5S P MED 13-14 P
Name of the group: 5. sem. PRE MED 13-14 povinné předměty
Requirement credits in the group: In this group you have to gain 21 credits
Requirement courses in the group: In this group you have to complete 9 courses
Credits in the group: 21
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 |
|---|---|---|---|---|---|---|
| 614DB | **Database Systems** | KZ | 2 | 0+2 | Z | z |
| 617DNV | **Transportation of Dangerous Goods** | KZ | 2 | 2+0 | Z | z |
| 617FIF | **Finances and Financing** | KZ | 2 | 2+0 | Z | z |
| 623KM | **Crisis Management** | KZ | 2 | 2+0 | Z | z |
| 617LOS | **Logistic Systems** | Z,ZK | 3 | 2+1 | Z | z |
| 617MSTP | **Small and Medium Enterprise** | KZ | 2 | 2+0 | Z | z |
| 617PDO | **Designing of Public Transport Services** | KZ | 3 | 2+1 | Z | z |
| 617TCHR | **Tourist Trade Techniques** | Z | 1 | 2+0 | Z | z |
| 617TGA | **Graph Theory and its Applications in Transport** *Josef Volek* | Z,ZK | 4 | 2P+2C+12B | Z | z |

**Characteristics of the courses of this group of Study Plan: Code=5S P MED 13-14 P Name=5. sem. PRE MED 13-14 povinné předměty**

| | | | |
|---|---|---|---|
| 614DB | Database Systems | KZ | 2 |
| Dbf. terminology, fundamentals of relational and object database systems, database structure, relations modelling, relation algebra, dbf. tools, database design process, user interface, remote data access. Basic statement of SQL language. Expert systems and knowledge based applications, knowledge representation, methods of derivating and implementating, interface for knowledge systems design, certainty and uncertainty in knowledge systems. | | | |
| 617DNV | Transportation of Dangerous Goods | KZ | 2 |
| Legal measures. Kinds of hazards. Classification. Carriage by road, railways, inland waterways, air and maritime transport. Obligations of consignors, carriers, consignees and safety advisors. System of international obligatory conditions. Enumerated list of dangerous goods. Packing and marking of packages. Transport documentation. Exempted and unlimited quantity. Crew, equipment, approval, marking, operation and construction of road vehicles. | | | |
| 617FIF | Finances and Financing | KZ | 2 |
| Cash flow, cost and revenue flow. Financial system functions. Financial assets. Types of financing. Company cash flow. Short-term financing instruments. Long-term financing instruments. Trading financial instruments. Banking financial instruments. Financial risk allocation instruments. Payment and hedging instruments. Loan capital. Risk capital. | | | |
| 623KM | Crisis Management | KZ | 2 |
| Extraordinary events in transport. Crisis states. Authorities of crisis management of the state. Crisis and emergency planning. Precautions of economic mobilization of the state. Use of state material reserves. Organization conditions for crisis states treatment. Technical means for elimination of results of extraordinary events. Protection and renewal of transport infrastucture, ensuring of operation. Information systems of crisis management. | | | |
| 617LOS | Logistic Systems | Z,ZK | 3 |
| Definition of logistics, development and science basics of logistics. Basic elements of logistic system, logistic chain. Technology in logistics. Goals and strategies of company logistic system. Transport in logistic system. Logistic technologies in air, rail and water transport. Information systems in logistics and passenger transport. Storage and distribution in logistics. Position of logistics in the Czech Republic and Europe. | | | |
| 617MSTP | Small and Medium Enterprise | KZ | 2 |
| SME, design, plan, market, analysis, finance, management, decision making, survival, growth. | | | |
| 617PDO | Designing of Public Transport Services | KZ | 3 |
| Transport planning, demand elasticity. Strategy and hierarchical planning of public transport system. Line network planning, concept of offer. Integrated periodic timetable. Planning process of long-distance and regional transport. Optimised number of rolling-stock, circulation plan of rolling-stock, rolling-stock strategy. Public service liability for various segments. Harmony of particular long-term plans. Controlled competition. Case studies. | | | |

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|---|---|---|---|
| 617TCHR | Tourist Trade Techniques | Z | 1 |
| Development and importance of the tourist trade, summary of tourist trade services with more detailed analysis of transport services and means of transport in the air, water and land (rail and road) transport. | | | |
| 617TGA | Graph Theory and its Applications in Transport | Z,ZK | 4 |
| Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines. | | | |

Code of the group: 5S P MED 13-14 PV
Name of the group: 5. sem. PRE MED 13-14 povinné předměty - výběr
Requirement credits in the group: In this group you have to gain 2 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 2
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 |
|---|---|---|---|---|---|---|
| 614TEU | **Creation of Scripts and Macros for Economic Tasks** | KZ | 2 | 0+2 | Z | z |
| 614WS2 | **Webdesign With Web Standards 2** | KZ | 2 | 0+2 | Z | z |

**Characteristics of the courses of this group of Study Plan: Code=5S P MED 13-14 PV Name=5. sem. PRE MED 13-14 povinné předměty - výběr**

| | | | |
|---|---|---|---|
| 614TEU | Creation of Scripts and Macros for Economic Tasks | KZ | 2 |
| Fundamentals of VBA, functions and procedures, examples of their use. Forms and offers for user oriented applications, cooperation with other applications, solution to compatibility problems among different spreadsheet programs versions. Everything with the respect to economic tasks. | | | |
| 614WS2 | Webdesign With Web Standards 2 | KZ | 2 |
| Advanced CSS techniques. Multi-level menu. SEO - Search Engine Optimization. Web technologies: JavaScript, Flash, PHP, AJAX. AccessKey, Favicon, rollovers, lightboxes. Using API for maps or searching. Audit and page statistics. Use of useful scripts. Systems for content management. | | | |

Code of the group: 6S P MED 13-14 P
Name of the group: 6. sem. PRE MED 13-14 povinné předměty
Requirement credits in the group: In this group you have to gain 23 credits
Requirement courses in the group: In this group you have to complete 10 courses
Credits in the group: 23
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 |
|---|---|---|---|---|---|---|
| 617DAS | **Transportation and Communication Law** | Z | 1 | 2+0 | L | z |
| 617DU | **Public Transport Service in a Territory** | KZ | 2 | 2+0 | L | z |
| 617ERP | **Company Economy and Management** | Z,ZK | 3 | 2+1 | L | z |
| 614ISYS | **Information Systems** | KZ | 2 | 2+0 | L | z |
| 617KS | **Quality of Transport and Telecommunication Systems** | KZ | 2 | 2+0 | L | z |
| 617MPD | **Management of Techonology Systems of Land Transport** | Z,ZK | 3 | 2+1 | L | z |
| 617MR | **Managerial Decision Making** | KZ | 3 | 2+1 | L | z |
| 617ODS | **Optimization on Transportation Networks** | Z,ZK | 3 | 2+1 | L | z |
| 617PZL | **Carriage and Forwarding** | Z,ZK | 3 | 2+1 | L | z |
| 617TAC | **Tariffs and Prices in Transport** | Z | 1 | 2+0 | L | z |

**Characteristics of the courses of this group of Study Plan: Code=6S P MED 13-14 P Name=6. sem. PRE MED 13-14 povinné předměty**

| | | | |
|---|---|---|---|
| 617DAS | Transportation and Communication Law | Z | 1 |
| Transportation and communication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent. | | | |
| 617DU | Public Transport Service in a Territory | KZ | 2 |
| Transport policy. Impact of European integration.Configuration and links. Contract ensuring. Funding. Tariff and ticketing system. Legal conditions. Survey and quantification of carriage demand. Transport scheduling. Quality criteria and standards. IT, Publicity, Promotion, Marketing. Case study on an Integrated Public Transport System. | | | |
| 617ERP | Company Economy and Management | Z,ZK | 3 |
| Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan. | | | |
| 614ISYS | Information Systems | KZ | 2 |
| State-of-the-art tools of objects control (control and planning) including problems related to these toole use, theory of information and knowledge, knowledge and expert systems, IS planning methodologies, transaction systems, theory of computer networks, semantic webs and sensitivity analysis. | | | |
| 617KS | Quality of Transport and Telecommunication Systems | KZ | 2 |
| Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty. | | | |

| | | | |
|---|---|---|---|
| 617MPD | Management of Techonology Systems of Land Transport | Z,ZK | 3 |
| Structure of vehicle systems, rational assessment, decision making in the managing activity, operation-technical and economic properties, technological subsystems in the field of the road and rail transport. | | | |
| 617MR | Managerial Decision Making | KZ | 3 |
| Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference. | | | |
| 617ODS | Optimization on Transportation Networks | Z,ZK | 3 |
| Introduction to optimization and heuristic methods, metaheristic methods, the history of optimization.Lagrangean approach, assignment problem - Hungarian method, minimum weighted matching, Little´s algorithm, vehicle routing problem - an extension of TSP, heuristic solution approaches to vehicle routing problem, local search techniques, Tabu Search, location problems - heuristic algorithms, genetic algorithms and extensions of genetic algorithms. | | | |
| 617PZL | Carriage and Forwarding | Z,ZK | 3 |
| carriage, forwarding, global economy, transport modes, law conditions, storage, dangerous goods, logistics, IT systems, insurance, distribution, customs | | | |
| 617TAC | Tariffs and Prices in Transport | Z | 1 |
| Transport and division of labour. Costs in transport. External costs. Financing of traffic in transport. Prices and tariffs. Tariffs of railway transport. Tariffs of road transport. Tariffs of air and water contract. Transport market. Service arrangement in public interest. Pricing policy history. Pricing in the EU. | | | |

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

Code of the group: PROJ 12-13
Name of the group: projekty 12-13 (4., 5., 6. sem.)
Requirement credits in the group: In this group you have to gain 6 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 6
Note on the group:

| **Code** | **Name of the course / Name of the group of courses** ***(in case of groups of courses the list of codes of their members)*** *Tutors,* ***authors*** *and guarantors (gar.)* | **Completion** | **Credits** | **Scope** | **Semester** | **Role** |
|---|---|---|---|---|---|---|
| 616X31 | **Project 1** | Z | 2 | 0P+1C | L | ZP |
| 617X31 | **Project 1** | Z | 2 | 0P+1C | L | ZP |
| 622X31 | **Project 1** | Z | 2 | 0P+1C | L | ZP |
| 612X31 | **Project 1** | Z | 2 | 0P+1C | L | ZP |
| 613X31 | **Project 1** | Z | 2 | 0+1 | L | ZP |
| 622X32 | **Project 2** | Z | 2 | 0P+2C | Z | ZP |
| 616X32 | **Project 2** | Z | 2 | 0P+2C | Z | ZP |
| 612X32 | **Project 2** *Jiří Čarský, Dagmar Kočárková* | Z | 2 | 0P+2C | Z | ZP |
| 617X32 | **Project 2** | Z | 2 | 0P+2C | Z | ZP |
| 616X33 | **Project 3** | Z | 2 | 0P+1C | L | ZP |
| 622X33 | **Project 3** | Z | 2 | 0P+1C | L | ZP |
| 612X33 | **Project 3** *Josef Kocourek, Tomáš Padělek, Aneta Matysková, Jiří Čarský, Dagmar Kočárková, Zuzana Čarská, David Hudec, Karolína Moudrá, Iva Šturmová, .....* | Z | 2 | 0P+1C | L | ZP |
| 617X33 | **Project 3** | Z | 2 | 0P+1C | L | ZP |

**Characteristics of the courses of this group of Study Plan: Code=PROJ 12-13 Name=projekty 12-13 (4., 5., 6. sem.)**

| | | | |
|---|---|---|---|
| 616X31 | Project 1 | Z | 2 |
| 617X31 | Project 1 | Z | 2 |
| 622X31 | Project 1 | Z | 2 |
| 612X31 | Project 1 | Z | 2 |
| 613X31 | Project 1 | Z | 2 |
| 622X32 | Project 2 | Z | 2 |
| 616X32 | Project 2 | Z | 2 |
| 612X32 | Project 2 | Z | 2 |
| 617X32 | Project 2 | Z | 2 |
| 616X33 | Project 3 | Z | 2 |
| 622X33 | Project 3 | Z | 2 |
| 612X33 | Project 3 | Z | 2 |
| 617X33 | Project 3 | Z | 2 |

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

The role of the block: PV

Code of the group: PVP PRE MED 12-13
Name of the group: PVP pro PRE MED 12-13 (ZS+LS)
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 |
|---|---|---|---|---|---|---|
| 615Y1BO | **Work Safety and Health Protection in Transportation** | KZ | 2 | 2P+0C | L | PV |
| 615Y1DZ | **History of Railway** | KZ | 2 | 2P+0C | L | PV |
| 617Y1DZ | **Transported Commodities Cognization** | KZ | 2 | 2+0 | L | PV |
| 615Y1HE | **Work Hygiene and Ergonomics in Traffic** | KZ | 2 | 2P+0C | Z | PV |
| 617Y1OF | **Personal Finance** *Alexandra Dvořáčková* | KZ | 2 | 2P+0C | Z | PV |
| 617Y1PM | **Personnel Management** *Stanislava Holíková* | KZ | 2 | 2P+0C | L | PV |
| 613Y1PM | **Personal Management** | KZ | 2 | 2+0 | L | PV |
| 612Y1PC | **Pedestrian and Cycling Transport** | KZ | 2 | 2P+0C | L | PV |
| 614Y1PG | **Computer Graphics** | KZ | 2 | 2P+0C | L | PV |
| 612Y1PD | **Assessment of Transport** *Kristýna Neubergová* | KZ | 2 | 2P+0C | Z | PV |
| 612Y1PU | **Organization Disposition of Railway Stations** | KZ | 2 | 2P+0C | L | PV |
| 617Y1ST | **Titan Simulation** | KZ | 2 | 2P+0C | L | PV |
| 612Y1SU | **Management and Maintenance of Roads** | KZ | 2 | 2P+0C | L | PV |
| 612Y1VC | **Waterways and Shipping** | KZ | 2 | 2P+0C | Z | PV |
| 612Y1VD | **Water Transport and Transportation** | KZ | 2 | 2+0 | L | PV |
| 614Y1ZM | **Fundamentals of parametric and adaptive modeling** | KZ | 2 | 2P+0C | L | PV |

**Characteristics of the courses of this group of Study Plan: Code=PVP PRE MED 12-13 Name=PVP pro PRE MED 12-13 (ZS+LS)**

| | | | |
|---|---|---|---|
| 615Y1BO | Work Safety and Health Protection in Transportation | KZ | 2 |

Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.

| | | | |
|---|---|---|---|
| 615Y1DZ | History of Railway | KZ | 2 |

Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.

| | | | |
|---|---|---|---|
| 617Y1DZ | Transported Commodities Cognization | KZ | 2 |
| 615Y1HE | Work Hygiene and Ergonomics in Traffic | KZ | 2 |

Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.

| | | | |
|---|---|---|---|
| 617Y1OF | Personal Finance | KZ | 2 |

Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).

| | | | |
|---|---|---|---|
| 617Y1PM | Personnel Management | KZ | 2 |

Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.

| | | | |
|---|---|---|---|
| 613Y1PM | Personal Management | KZ | 2 |
| 612Y1PC | Pedestrian and Cycling Transport | KZ | 2 |

Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.

| | | | |
|---|---|---|---|
| 614Y1PG | Computer Graphics | KZ | 2 |

Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.

| | | | |
|---|---|---|---|
| 612Y1PD | Assessment of Transport | KZ | 2 |

Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.

| | | | |
|---|---|---|---|
| 612Y1PU | Organization Disposition of Railway Stations | KZ | 2 |
| Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network. | | | |
| 617Y1ST | Titan Simulation | KZ | 2 |
| Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions. | | | |
| 612Y1SU | Management and Maintenance of Roads | KZ | 2 |
| Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering. | | | |
| 612Y1VC | Waterways and Shipping | KZ | 2 |
| Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps. | | | |
| 612Y1VD | Water Transport and Transportation | KZ | 2 |
| Technologické možnosti vnitrozemské plavby. Základní rozdělení vnitrozemských plavidel a jejich základní parametry. Základy konstrukce a stavby plavidel. Efektivnost vodní dopravy a finanční náročnost výstavby infrastruktury vodní dopravy. Poptávka po vodní dopravě v České republice. Způsoby financování investičních a provozních nákladů infrastruktury vodní dopravy (vodní cesty, přístavy loděnice apod.). Námořní doprava obecně a v podmínkách ČR. | | | |
| 614Y1ZM | Fundamentals of parametric and adaptive modeling | KZ | 2 |
| Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation. | | | |

Name of the block: Jazyky
Minimal number of credits of the block: 12
The role of the block: J

Code of the group: JAZ 2 PRE (5.-6.SEM)
Name of the group: Jazyky bak. PRE pro 5. a 6. sem. (2.cizí jazyk)
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<br>*(in case of groups of courses the list of codes of their members)*<br>*Tutors,* ***authors*** *and guarantors (gar.)* | Completion | Credits | Scope | Semester | Role |
|---|---|---|---|---|---|---|
| 615JZ3A | **Foreign Language - English 3** | Z | 3 | 0P+4C | Z | J |
| 615JZ4A | **Foreign Language - English 4** | Z,ZK | 3 | 0+4 | L | J |
| 615JZ3N | **Foreign Language - German 3**<br>*René Skalický* | Z | 3 | 0P+4C+10B | Z | J |
| 615JZ4N | **Foreign Language - German 4**<br>*René Skalický* | Z,ZK | 3 | 0P+4C+10B | L | J |
| 615JZ3R | **Foreign Language - Russian 3**<br>*Vilma Gottwaldová* | Z | 3 | 0P+4C+10B | Z | J |
| 615JZ4R | **Foreign Language - Russian 4**<br>*Vilma Gottwaldová* | Z,ZK | 3 | 0P+4C+10B | L | J |

**Characteristics of the courses of this group of Study Plan: Code=JAZ 2 PRE (5.-6.SEM) Name=Jazyky bak. PRE pro 5. a 6. sem. (2.cizí jazyk)**

| | | | |
|---|---|---|---|
| 615JZ3A | Foreign Language - English 3 | 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. | | | |
| 615JZ4A | Foreign Language - English 4 | 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. | | | |
| 615JZ3N | Foreign Language - German 3 | Z | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | | | |
| 615JZ4N | Foreign Language - German 4 | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | | | |

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

Code of the group: J1 P 12-13(3.-4.SEM)
Name of the group: Jazyky PREZ 12-13 pro 3. a 4. sem. (1.cizí jazyk) - bez RJ
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 |
|---|---|---|---|---|---|---|
| 615JZ1A | **Foreign Language - English 1** *Věra Pastorková* | Z | 3 | 0P+4C+10B | Z | J |
| 615JZ2A | **Foreign Language - English 2** *Věra Pastorková* | Z,ZK | 3 | 0P+4C+10B | L | J |
| 615JZ1N | **Foreign Language - German 1** | Z | 3 | 0+4 | Z | J |
| 615JZ2N | **Foreign Language - German 2** | Z,ZK | 3 | 0+4 | L | J |

**Characteristics of the courses of this group of Study Plan: Code=J1 P 12-13(3.-4.SEM) Name=Jazyky PREZ 12-13 pro 3. a 4. sem. (1.cizí jazyk) - bez RJ**

| | | | |
|---|---|---|---|
| 615JZ1A | Foreign Language - English 1 | Z | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric. | | | |
| 615JZ2A | Foreign Language - English 2 | Z,ZK | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric. | | | |
| 615JZ1N | 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. | | | |
| 615JZ2N | 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. | | | |

## List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|---|---|---|---|
| 611DAD | Differential and Difference Equations | Z,ZK | 3 |
| Concept of a differential equation of the first order and some methods of its solution. Differential equations of the n-th order, linear diferential equations. Initial and boundary conditions for ordinary linear differential equation of the second order. Systems of linear differential equations. Difference equations, linear difference equations and their systems. | | | |
| 611FY1 | Physics 1 | Z,ZK | 4 |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current. | | | |
| 611FY2 | 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. | | | |
| 611GIE | Geometry | KZ | 3 |
| Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet`s trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path. | | | |
| 611LA | Linear Algebra | Z,ZK | 3 |
| Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification. | | | |

| | | | |
|---|---|---|---|
| 611MSP | Modeling of Systems and Processes | Z,ZK | 4 |
| System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection. | | | |
| 611MTA | 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. | | | |
| 611MVP | 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. | | | |
| 611PT | 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. | | | |
| 611SIS | 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. | | | |
| 612MDE | Transport Models and Transport Excesses | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency. | | | |
| 612PKD | 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. | | | |
| 612PPOK | Designing Roads, Highways and Motorways | KZ | 3 |
| Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections. | | | |
| 612X31 | Project 1 | Z | 2 |
| 612X32 | Project 2 | Z | 2 |
| 612X33 | Project 3 | Z | 2 |
| 612Y1PC | Pedestrian and Cycling Transport | KZ | 2 |
| Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists. | | | |
| 612Y1PD | Assessment of Transport | KZ | 2 |
| Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment. | | | |
| 612Y1PU | Organization Disposition of Railway Stations | KZ | 2 |
| Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network. | | | |
| 612Y1SU | Management and Maintenance of Roads | KZ | 2 |
| Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering. | | | |
| 612Y1VC | Waterways and Shipping | KZ | 2 |
| Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps. | | | |
| 612Y1VD | Water Transport and Transportation | KZ | 2 |
| Technologické možnosti vnitrozemské plavby. Základní rozdělení vnitrozemských plavidel a jejich základní parametry. Základy konstrukce a stavby plavidel. Efektivnost vodní dopravy a finanční náročnost výstavby infrastruktury vodní dopravy. Poptávka po vodní dopravě v České republice. Způsoby financování investičních a provozních nákladů infrastruktury vodní dopravy (vodní cesty, přístavy loděnice apod.). Námořní doprava obecně a v podmínkách ČR. | | | |
| 612ZADI | 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. | | | |
| 613E | Economics | Z,ZK | 3 |
| 613EDOT | Economy, Transport, Telecommunications | KZ | 2 |
| 613EDTP | Economy and Management of Transport and Telecommunication Processes | Z,ZK | 3 |
| Transport and telecommunication system, financing of transport infrastructure, transport policy, transport service, energy sources, public goods, externalities in transport and their treatment, assessment of public projects, CBA method, transport company, costing in transportation, transport quality. | | | |
| 613HG | Economic Geography | Z | 2 |
| Introduction of the issues, definitions and introductory concepts. World geography and its research subject. Economic geography - Europe, Asia, Africa, Australia, America, the Czech Republic. Transport geography and its research subject. Characteristics of transportation as one of the branches of the global economy. Transport systems and their location in the world. Particular transport modes as part of the economy and the world transport system. | | | |
| 613MVD | Marketing in Transportation | Z,ZK | 2 |
| General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan. | | | |
| 613X31 | Project 1 | Z | 2 |

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| 613Y1PM | Personal Management | KZ | 2 |
| 614DB | Database Systems | KZ | 2 |
| Dbf. terminology, fundamentals of relational and object database systems, database structure, relations modelling, relation algebra, dbf. tools, database design process, user interface, remote data access. Basic statement of SQL language. Expert systems and knowledge based applications, knowledge representation, methods of derivating and implementating, interface for knowledge systems design, certainty and uncertainty in knowledge systems. | | | |
| 614EAT | Economic Analyses in Spreadsheets Programs Environment | KZ | 2 |
| Work with spreadsheet programs with the respect to economic problems, use of nested functions and conditional formatting, statistic and mathematic functions. Creation of graphs and other graphic outputs. Data analysis, lists and contingent tables. | | | |
| 614ISYS | Information Systems | KZ | 2 |
| State-of-the-art tools of objects control (control and planning) including problems related to these toole use, theory of information and knowledge, knowledge and expert systems, IS planning methodologies, transaction systems, theory of computer networks, semantic webs and sensitivity analysis. | | | |
| 614KSP | Constructing with Computer Aid | KZ | 2 |
| "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilites, AutoCAD environment profiles, drawings with raster foundaments). | | | |
| 614SIAP | 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. | | | |
| 614TEU | Creation of Scripts and Macros for Economic Tasks | KZ | 2 |
| Fundamentals of VBA, functions and procedures, examples of their use. Forms and offers for user oriented applications, cooperation with other applications, solution to compatibility problems among different spreadsheet programs versions. Everything with the respect to economic tasks. | | | |
| 614UATT | Introduction to Automatization and Telecommunication Systems | KZ | 2 |
| Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transpotation, modelling and projecting of transport systems, integrated technological and infromation system in post, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedial networks and services, NGN networks. | | | |
| 614UPRO | 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. | | | |
| 614WS1 | Webdesign With Web Standards 1 | KZ | 2 |
| HTTP, URL, markup languages HTML and XHTML, anchors, tables, images, lists, forms, features of CSS, rules of accessible web pages, usability of web pages, problems of different browsers, one, two and three column pages, page validation, conditional comments, CSS hacks. | | | |
| 614WS2 | Webdesign With Web Standards 2 | KZ | 2 |
| Advanced CSS techniques. Multi-level menu. SEO - Search Engine Optimization. Web technologies: JavaScript, Flash, PHP, AJAX. AccessKey, Favicon, rollovers, lightboxes. Using API for maps or searching. Audit and page statistics. Use of useful scripts. Systems for content management. | | | |
| 614Y1PG | Computer Graphics | KZ | 2 |
| Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards. | | | |
| 614Y1ZM | Fundamentals of parametric and adaptive modeling | KZ | 2 |
| Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation. | | | |
| 614ZAET | 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 elementar methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triplangel and principle of superposition in direct current circuits. | | | |
| 614ZINF | 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. | | | |
| 615JZ1A | Foreign Language - English 1 | Z | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric. | | | |
| 615JZ1N | 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. | | | |
| 615JZ2A | Foreign Language - English 2 | Z,ZK | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric. | | | |
| 615JZ2N | 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. | | | |
| 615JZ3A | Foreign Language - English 3 | 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. | | | |
| 615JZ3N | Foreign Language - German 3 | Z | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | | | |

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| 615JZ3R | Foreign Language - Russian 3 | Z | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | | | |
| 615JZ4A | Foreign Language - English 4 | 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. | | | |
| 615JZ4N | Foreign Language - German 4 | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | | | |
| 615JZ4R | Foreign Language - Russian 4 | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | | | |
| 615Y1BO | Work Safety and Health Protection in Transportation | KZ | 2 |
| Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice. | | | |
| 615Y1DZ | History of Railway | KZ | 2 |
| Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections. | | | |
| 615Y1HE | Work Hygiene and Ergonomics in Traffic | KZ | 2 |
| Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative. | | | |
| 616UDDM | 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. | | | |
| 616X31 | Project 1 | Z | 2 |
| 616X32 | Project 2 | Z | 2 |
| 616X33 | Project 3 | Z | 2 |
| 617DAS | Transportation and Communication Law | Z | 1 |
| Transportation and communication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent. | | | |
| 617DNV | Transportation of Dangerous Goods | KZ | 2 |
| Legal measures. Kinds of hazards. Classification. Carriage by road, railways, inland waterways, air and maritime transport. Obligations of consignors, carriers, consignees and safety advisors. System of international obligatory conditions. Enumerated list of dangerous goods. Packing and marking of packages. Transport documentation. Exempted and unlimited quantity. Crew, equipment, approval, marking, operation and construction of road vehicles. | | | |
| 617DU | Public Transport Service in a Territory | KZ | 2 |
| Transport policy. Impact of European integration.Configuration and links. Contract ensuring. Funding. Tariff and ticketing system. Legal conditions. Survey and quantification of carriage demand. Transport scheduling. Quality criteria and standards. IT, Publicity, Promotion, Marketing. Case study on an Integrated Public Transport System. | | | |
| 617EM | Management Science | KZ | 2 |
| Linear Programming, graphical interpretation and solution of LP problem. Types of distribution problems, transportation problem. Models of network analysis. Models of queuing theory. Models of inventory management. Simulation models. | | | |
| 617ERP | Company Economy and Management | Z,ZK | 3 |
| Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan. | | | |
| 617FIF | Finances and Financing | KZ | 2 |
| Cash flow, cost and revenue flow. Financial system functions. Financial assets. Types of financing. Company cash flow. Short-term financing instruments. Long-term financing instruments. Trading financial instruments. Banking financial instruments. Financial risk allocation instruments. Payment and hedging instruments. Loan capital. Risk capital. | | | |
| 617GEDS | Geography of Transport Systems | KZ | 2 |
| Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction - theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographical analysis in transportation planning. | | | |
| 617KS | Quality of Transport and Telecommunication Systems | KZ | 2 |
| Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty. | | | |
| 617LOS | Logistic Systems | Z,ZK | 3 |
| Definition of logistics, development and science basics of logistics. Basic elements of logistic system, logistic chain. Technology in logistics. Goals and strategies of company logistic system. Transport in logistic system. Logistic technologies in air, rail and water transport. Information systems in logistics and passenger transport. Storage and distribution in logistics. Position of logistics in the Czech Republic and Europe. | | | |
| 617MEKA | Methods of Economics Analysis | KZ | 2 |
| The techniques of economical analysis in the domain of analysis of dependencies, analysis and construction of time series and comparsion of statistical values using differencies and indices. | | | |
| 617MPD | Management of Techonology Systems of Land Transport | Z,ZK | 3 |
| Structure of vehicle systems, rational assessment, decision making in the managing activity, operation-technical and economic properties, technological subsystems in the field of the road and rail transport. | | | |
| 617MR | Managerial Decision Making | KZ | 3 |
| Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference. | | | |
| 617MSTP | Small and Medium Enterprise | KZ | 2 |
| SME, design, plan, market, analysis, finance, management, decision making, survival, growth. | | | |

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| 617ODS | Optimization on Transportation Networks | Z,ZK | 3 |
| Introduction to optimization and heuristic methods, metaheristic methods, the history of optimization.Lagrangean approach, assignment problem - Hungarian method, minimum weighted matching, Little´s algorithm, vehicle routing problem - an extension of TSP, heuristic solution approaches to vehicle routing problem, local search techniques, Tabu Search, location problems - heuristic algorithms, genetic algorithms and extensions of genetic algorithms. | | | |
| 617PDO | Designing of Public Transport Services | KZ | 3 |
| Transport planning, demand elasticity. Strategy and hierarchical planning of public transport system. Line network planning, concept of offer. Integrated periodic timetable. Planning process of long-distance and regional transport. Optimised number of rolling-stock, circulation plan of rolling-stock, rolling-stock strategy. Public service liability for various segments. Harmony of particular long-term plans. Controlled competition. Case studies. | | | |
| 617PZL | Carriage and Forwarding | Z,ZK | 3 |
| carriage, forwarding, global economy, transport modes, law conditions, storage, dangerous goods, logistics, IT systems, insurance, distribution, customs | | | |
| 617RIP | Project Management | KZ | 2 |
| Project, influences, pressures and influences. Entrepreneurial plan and capital decision making. Marketing, break-even point assessment. Project management and his characters. Organizational structures in project management. Feasibility study. Capital and operational costs assessment. Process of choosing optimal variant. Cost Benefit Analysis. Models of project financing. Life cycle of project. Financial anal. of capital projects. Project risks. | | | |
| 617TAC | Tariffs and Prices in Transport | Z | 1 |
| Transport and division of labour. Costs in transport. External costs. Financing of traffic in transport. Prices and tariffs. Tariffs of railway transport. Tariffs of road transport. Tariffs of air and water contract. Transport market. Service arrangement in public interest. Pricing policy history. Pricing in the EU. | | | |
| 617TCHR | Tourist Trade Techniques | Z | 1 |
| Development and importance of the tourist trade, summary of tourist trade services with more detailed analysis of transport services and means of transport in the air, water and land (rail and road) transport. | | | |
| 617TDLK | Transport Technology and Logistics | Z,ZK | 4 |
| 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. | | | |
| 617TGA | Graph Theory and its Applications in Transport | Z,ZK | 4 |
| Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines. | | | |
| 617X31 | Project 1 | Z | 2 |
| 617X32 | Project 2 | Z | 2 |
| 617X33 | Project 3 | Z | 2 |
| 617Y1DZ | Transported Commodities Cognization | KZ | 2 |
| 617Y1OF | Personal Finance | KZ | 2 |
| Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance). | | | |
| 617Y1PM | Personnel Management | KZ | 2 |
| Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication. | | | |
| 617Y1ST | Titan Simulation | KZ | 2 |
| Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions. | | | |
| 618KIAD | Kinematics and Dynamics | Z,ZK | 2 |
| Motion along a line, motion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point mass dynamics and system of point masses, equation of motion. Method of Newton. Princle of D´Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with multiple degrees of freedom. | | | |
| 618MRI1 | 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. Dephectostopic testing. Corosion. | | | |
| 618MRI2 | Materials 2 | KZ | 2 |
| Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials. | | | |
| 618PZP | Elasticity and Strength | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis. | | | |
| 618ST | 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. | | | |
| 618TTED | 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. | | | |
| 620SSA | 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. | | | |
| 620UIS | 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. | | | |
| 621ZLDK | Introduction to Air Transport | KZ | 3 |
| 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. | | | |
| 622UN | Traffic Accidents Introduction | Z | 2 |
| 622X31 | Project 1 | Z | 2 |

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| 622X32 | Project 2 | Z | 2 |
| 622X33 | Project 3 | Z | 2 |
| 623KM | Crisis Management | KZ | 2 |

Extraordinary events in transport. Crisis states. Authorities of crisis management of the state. Crisis and emergency planning. Precautions of economic mobilization of the state. Use of state material reserves. Organization conditions for crisis states treatment. Technical means for elimination of results of extraordinary events. Protection and renewal of transport infrastucture, ensuring of operation. Information systems of crisis management.

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