

# Study plan

## Name of study plan: PRE bak. studium od 20-21 (spol. část studia) - program B3710

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: 90

Elective courses credits: 0

Sum of credits in the plan: 90

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 90

The role of the block: Z

Code of the group: 1S PRE 20-21 P

Name of the group: 1. sem. bak. PRE 20-21 povinné p edm ty (spol. část studia) - pro B3710

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<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 |
|---------|---|------------|---------|-----------|----------|------|
| 611CAL1 | <b>Calculus 1</b><br>Romana Zibnerová   | Z,ZK       | 7       | 2P+4C+2B  | Z        | z    |
| 611LA   | <b>Linear Algebra</b><br>Romana Zibnerová   | Z,ZK       | 3       | 2P+1C+10B | Z        | z    |
| 612ZYDI | <b>Introduction to Transportation Engineering</b><br>Dagmar Koárková  | Z,ZK       | 2       | 1P+1C     | Z        | z    |
| 618MTY  | <b>Materials Science and Engineering</b><br>Vít Malinovský  | Z,ZK       | 3       | 2P+1C+10B | Z        | z    |
| 611GIE  | <b>Geometry</b><br>Vít Malinovský   | KZ         | 3       | 2P+2C+12B | Z        | z    |
| 614ASD  | <b>Algorithm and Data Structures</b><br>Jan Mejstík   | KZ         | 3       | 0P+2C+8B  | Z        | z    |
| 614KSP  | <b>Constructing with Computer Aid</b><br>Libor Židek  | KZ         | 2       | 0P+2C+8B  | Z        | z    |
| 618TED  | <b>Technical Documentation</b><br>Vít Malinovský  | KZ         | 2       | 1P+1C+8B  | Z        | z    |
| 615DPLG | <b>Transportation Psychology</b><br>Jana Štikarová  | Z          | 2       | 2P+0C+6B  | Z        | z    |
| 616UDOP | <b>Introduction into Vehicles</b><br>Zuzana Radová  | Z          | 2       | 2P+0C+8B  | Z        | z    |
| TV-1    | <b>Physical Education</b>   | Z          | 1       |           | Z        | z    |

### Characteristics of the courses of this group of Study Plan: Code=1S PRE 20-21 P Name=1. sem. bak. PRE 20-21 povinné p edm ty (spol. část studia) - pro B3710

|         |   |      |   |
|---------|---|------|---|
| 611CAL1 | Calculus 1<br>Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Eukclidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables. | Z,ZK | 7 |
| 611LA   | Linear Algebra<br>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.                                  | Z,ZK | 3 |
| 612ZYDI | Introduction to Transportation Engineering<br>Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.  | Z,ZK | 2 |

|   |                                   |      |   |
|---|-----------------------------------|------|---|
| 618MTY  | Materials Science and Engineering | Z,ZK | 3 |
| Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests. |                                   |      |   |
| 611GIE  | Geometry                          | KZ   | 3 |
| Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path.   |                                   |      |   |
| 614ASD  | Algorithm and Data Structures     | KZ   | 3 |
| Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.                         |                                   |      |   |
| 614KSP  | Constructing with Computer Aid    | KZ   | 2 |
| "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).  |                                   |      |   |
| 618TED  | Technical Documentation           | KZ   | 2 |
| Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.  |                                   |      |   |
| 615DPLG   | Transportation Psychology         | Z    | 2 |
| Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.  |                                   |      |   |
| 616UDOP   | Introduction into Vehicles        | Z    | 2 |
| Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.  |                                   |      |   |
| TV-1  | Physical Education                | Z    | 1 |

Code of the group: 2S PRE 20-21 P

Name of the group: 2. sem. bak. PRE 20-21 povinné p edm ty (spol. ást studia) - pro B3710

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

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 30

Note on the group:

| Code    | Name of the course / Name of the group of courses<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 |
|---------|---|------------|---------|-----------|----------|------|
| 611CAL2 | <b>Calculus 2</b><br>Romana Zibnerová   | Z,ZK       | 5       | 2P+3C+20B | L        | Z    |
| 611STAT | <b>Statistics</b><br>Pavel Provinský, Pavla Pecherková  | Z,ZK       | 4       | 2P+2C+12B | L        | Z    |
| 612ZTS  | <b>Railway Lines and Stations</b><br>Tomáš Javoík, Ondřej Trešl   | Z,ZK       | 4       | 2P+2C+10B | L        | Z    |
| 618SAT  | <b>Structural Analysis</b><br>Tomáš Doktor  | Z,ZK       | 4       | 2P+2C+14B | L        | Z    |
| 620SYSA | <b>Systems Analysis</b><br>Petr Bureš, Jiří Růžička   | Z,ZK       | 5       | 2P+2C+14B | L        | Z    |
| 614PRG  | <b>Programming</b><br>Libor Židek   | KZ         | 2       | 0P+2C+8B  | L        | Z    |
| 617TEDL | <b>Transport Technology and Logistics</b><br>Michal Drábek Michal Drábek (Gar.)   | KZ         | 3       | 2P+1C     | L        | Z    |
| 621ZALD | <b>Basics of Air Transport</b><br>Jakub Hospodka  | KZ         | 2       | 0P+2C+8B  | L        | Z    |
| TV-2    | <b>Physical Education</b>   | Z          | 1       |           | L        | Z    |

Characteristics of the courses of this group of Study Plan: Code=2S PRE 20-21 P Name=2. sem. bak. PRE 20-21 povinné p edm ty (spol. ást studia) - pro B3710

|   |                            |      |   |
|---|----------------------------|------|---|
| 611CAL2   | Calculus 2                 | Z,ZK | 5 |
| Antiderivative, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in $R^n$ . Parametric description of regular $k$ -dimensional surfaces in $R^n$ , Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems. |                            |      |   |
| 611STAT   | Statistics                 | Z,ZK | 4 |
| Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.            |                            |      |   |
| 612ZTS  | Railway Lines and Stations | Z,ZK | 4 |
| Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.   |                            |      |   |
| 618SAT  | Structural Analysis        | Z,ZK | 4 |
| General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.                                      |                            |      |   |

|  |                                    |      |   |
|--|------------------------------------|------|---|
| 620SYSA  | Systems Analysis                   | Z,ZK | 5 |
| Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis. |                                    |      |   |
| 614PRG   | Programming                        | KZ   | 2 |
| Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.   |                                    |      |   |
| 617TEDL  | Transport Technology and Logistics | KZ   | 3 |
| Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.  |                                    |      |   |
| 621ZALD  | Basics of Air Transport            | KZ   | 2 |
| History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.          |                                    |      |   |
| TV-2   | Physical Education                 | Z    | 1 |

Code of the group: 3S PRE 21-22 P

Name of the group: 3. sem. bak. PRE 21-22 povinné p edm ty (S S) - B3710

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

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 30

Note on the group:

| Code    | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br><i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope     | Semester | Role |
|---------|--|------------|---------|-----------|----------|------|
| 611FYZ  | <b>Physics</b><br><i>Kurt Fišer</i>  | Z,ZK       | 5       | 2P+2C+18B | Z        | z    |
| 612MDE  | <b>Transport Models and Transport Excesses</b><br><i>Josef Kocourek, Tomáš Pad lek, Aneta Matysková</i>  | Z,ZK       | 3       | 2P+1C+8B  | Z        | z    |
| 617TGA  | <b>Graph Theory and its Applications in Transport</b><br><i>Josef Volek</i>  | Z,ZK       | 4       | 2P+2C+12B | Z        | z    |
| 618PZP  | <b>Elasticity and Strength</b><br><i>Tomáš Doktor, Petr Koudelka, Radim Dvoák</i>  | Z,ZK       | 3       | 2P+1C+10B | Z        | z    |
| 620UITS | <b>Introduction to Intelligent Transport Systems</b><br><i>Vladimír Faltus</i>   | Z,ZK       | 7       | 3P+2C+20B | Z        | z    |
| 612PPOK | <b>Designing Roads, Highways and Motorways</b><br><i>Jiří arský, Petr Kumpošt</i>  | KZ         | 3       | 1P+2C+10B | Z        | z    |
| 614DATS | <b>Database Systems</b><br><i>Ondřej Smlíšek</i>   | KZ         | 2       | 1P+1C+10B | Z        | z    |
| 615JZ1A | <b>Foreign Language - English 1</b><br><i>Vra Pastorková</i>   | Z          | 3       | 0P+4C+10B | Z        | z    |

Characteristics of the courses of this group of Study Plan: Code=3S PRE 21-22 P Name=3. sem. bak. PRE 21-22 povinné p edm ty (S S) - B3710

|   |  |      |   |
|---|--|------|---|
| 611FYZ  | Physics  | Z,ZK | 5 |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.  |  |      |   |
| 612MDE  | Transport Models and Transport Excesses        | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.       |  |      |   |
| 617TGA  | Graph Theory and its Applications in Transport | Z,ZK | 4 |
| Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines.  |  |      |   |
| 618PZP  | Elasticity and Strength                        | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.                               |  |      |   |
| 620UITS   | Introduction to Intelligent Transport Systems  | Z,ZK | 7 |
| Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS. |  |      |   |
| 612PPOK   | Designing Roads, Highways and Motorways        | KZ   | 3 |
| Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.                     |  |      |   |
| 614DATS   | Database Systems                               | KZ   | 2 |
| Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.   |  |      |   |
| 615JZ1A   | Foreign Language - English 1                   | Z    | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.  |  |      |   |

## List of courses of this pass:

| Code    | Name of the course   | Completion | Credits |
|---------|--|------------|---------|
| 611CAL1 | Calculus 1<br>Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Eukclidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.  | Z,ZK       | 7       |
| 611CAL2 | Calculus 2<br>Antiderivative, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in R <sub>n</sub> . Parametric description of regular k-dimensional surfaces in R <sub>n</sub> , Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems. | Z,ZK       | 5       |
| 611FYZ  | Physics<br>Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.  | Z,ZK       | 5       |
| 611GIE  | Geometry<br>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.  | KZ         | 3       |
| 611LA   | Linear Algebra<br>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.   | Z,ZK       | 3       |
| 611STAT | Statistics<br>Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.                           | Z,ZK       | 4       |
| 612MDE  | Transport Models and Transport Excesses<br>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.   | Z,ZK       | 3       |
| 612PPOK | Designing Roads, Highways and Motorways<br>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.   | KZ         | 3       |
| 612ZTS  | Railway Lines and Stations<br>Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.  | Z,ZK       | 4       |
| 612ZYDI | Introduction to Transportation Engineering<br>Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.   | Z,ZK       | 2       |
| 614ASD  | Algorithm and Data Structures<br>Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.                           | KZ         | 3       |
| 614DATS | Database Systems<br>Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.  | KZ         | 2       |
| 614KSP  | Constructing with Computer Aid<br>"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).   | KZ         | 2       |
| 614PRG  | Programming<br>Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.  | KZ         | 2       |
| 615DPLG | Transportation Psychology<br>Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.  | Z          | 2       |
| 615JZ1A | Foreign Language - English 1<br>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.   | Z          | 3       |
| 616UDOP | Introduction into Vehicles<br>Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.   | Z          | 2       |
| 617TEDL | Transport Technology and Logistics<br>Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.  | KZ         | 3       |
| 617TGA  | Graph Theory and its Applications in Transport<br>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.   | Z,ZK       | 4       |

|   |   |      |   |
|---|---|------|---|
| 618MTY  | Materials Science and Engineering             | Z,ZK | 3 |
| Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests. |   |      |   |
| 618PZP  | Elasticity and Strength                       | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.   |   |      |   |
| 618SAT  | Structural Analysis                           | Z,ZK | 4 |
| General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.                                |   |      |   |
| 618TED  | Technical Documentation                       | KZ   | 2 |
| Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.  |   |      |   |
| 620SYSA   | Systems Analysis                              | Z,ZK | 5 |
| Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis.                |   |      |   |
| 620UITS   | Introduction to Intelligent Transport Systems | Z,ZK | 7 |
| Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS.   |   |      |   |
| 621ZALD   | Basics of Air Transport                       | KZ   | 2 |
| History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.                         |   |      |   |
| TV-1  | Physical Education                            | Z    | 1 |
| TV-2  | Physical Education                            | Z    | 1 |

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

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