

Study plan

Name of study plan: TR nav.prez.12/13

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: Follow-up master full-time

Required credits: 50

Elective courses credits: 0

Sum of credits in the plan: 50

Note on the plan:

Name of the block: Semestrální projekt

Minimal number of credits of the block: 4

The role of the block: ZP

Code of the group: XN1 11/12

Name of the group: Projekt nav.1.sem.od 11/12

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 |
|-------|--|------------|---------|----------|----------|------|
| 11XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 12XN1 | Master Project 1 <i>Vladimír Pušman, Ondřej Nováček</i> | Z | 2 | 0P+2C+4B | Z | ZP |
| 13XN1 | Master Project 1 | Z | 2 | 0+2 | Z | ZP |
| 14XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 15XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 23XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 17XN1 | Master Project 1 <i>Václav Baroch, Edvard Bezdina, Michal Drábek, Alexandra Dvořáková, Veronika Fajfrová, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová,</i> | Z | 2 | 0P+2C+4B | Z | ZP |
| 18XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 20XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 21XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |
| 22XN1 | Master Project 1 <i>Tomáš Mišuněk, Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zdeněk Svátý</i> | Z | 2 | 0P+2C+4B | Z | ZP |
| 16XN1 | Master Project 1 | Z | 2 | 0P+2C+4B | Z | ZP |

Characteristics of the courses of this group of Study Plan: Code=XN1 11/12 Name=Projekt nav.1.sem.od 11/12

| | | | |
|-------|------------------|---|---|
| 11XN1 | Master Project 1 | Z | 2 |
| 12XN1 | Master Project 1 | Z | 2 |
| 13XN1 | Master Project 1 | Z | 2 |
| 14XN1 | Master Project 1 | Z | 2 |
| 15XN1 | Master Project 1 | Z | 2 |
| 23XN1 | Master Project 1 | Z | 2 |
| 17XN1 | Master Project 1 | Z | 2 |
| 18XN1 | Master Project 1 | Z | 2 |
| 20XN1 | Master Project 1 | Z | 2 |
| 21XN1 | Master Project 1 | Z | 2 |
| 22XN1 | Master Project 1 | Z | 2 |
| 16XN1 | Master Project 1 | Z | 2 |

Code of the group: XN2 11/12

Name of the group: Projekt nav.2.sem.od 11/12

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) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|-------|--|------------|---------|----------|----------|------|
| 11XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 12XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 13XN2 | Master Project 2 | Z | 2 | 0+2 | L | ZP |
| 14XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 15XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 23XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 17XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 18XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 20XN2 | Master Project 2 <i>Vladimír Faltus</i> | Z | 2 | 0P+2C+8B | L | ZP |
| 21XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 22XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |
| 16XN2 | Master Project 2 | Z | 2 | 0P+2C+8B | L | ZP |

Characteristics of the courses of this group of Study Plan: Code=XN2 11/12 Name=Projekt nav.2.sem.od 11/12

| | | | |
|-------|------------------|---|---|
| 11XN2 | Master Project 2 | Z | 2 |
| 12XN2 | Master Project 2 | Z | 2 |
| 13XN2 | Master Project 2 | Z | 2 |
| 14XN2 | Master Project 2 | Z | 2 |
| 15XN2 | Master Project 2 | Z | 2 |
| 23XN2 | Master Project 2 | Z | 2 |
| 17XN2 | Master Project 2 | Z | 2 |
| 18XN2 | Master Project 2 | Z | 2 |
| 20XN2 | Master Project 2 | Z | 2 |
| 21XN2 | Master Project 2 | Z | 2 |
| 22XN2 | Master Project 2 | Z | 2 |
| 16XN2 | Master Project 2 | Z | 2 |

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 42

The role of the block: P

Code of the group: 1.S.NPTR 11/12

Name of the group: 1.sem.nav.prez.TR od 11/12

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 8 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) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|-------|--|------------|---------|-------|----------|------|
| 12TDP | Traffic Flow Theory <i>Vladimír Faltus</i> | Z,ZK | 3 | 2P+1C | Z | P |
| 17ILO | Information Technology in Logistics | Z,ZK | 4 | 2+2 | Z | P |
| 17LGY | Logistics Systems | Z,ZK | 6 | 3+2 | Z | P |
| 17PJM | Project Management | ZK | 2 | 2+0 | Z | P |
| 11MME | Mathematical Models in Economics | KZ | 2 | 1+1 | Z | P |

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|--------|--|---|---|-----------|---|---|
| 12DZP | Transport and Environment | Z | 2 | 2P+0C | Z | P |
| 15J2A1 | Language - English 1 <i>Markéta Olehlová, Jitka He manová, Marie Michlová, Lenka Monková, Markéta Vojanová, Peter Morpuss, Jan Feit, Eva Rezlerová</i> | Z | 2 | 0P+2C+10B | Z | P |
| 15J2S1 | Language - Spanish 1 <i>Eva Rezlerová, Nina Hricsina Puškinová</i> | Z | 2 | 0P+2C+10B | Z | P |

Characteristics of the courses of this group of Study Plan: Code=1.S.NPTR 11/12 Name=1.sem.nav.prez.TR od 11/12

| | | | | |
|--------|-------------------------------------|------|---|--|
| 12TDP | Traffic Flow Theory | Z,ZK | 3 | Mobility and associated human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamentals and applications of mathematical models. Macroscopic, statistical and microscopic models. Theory of shock waves, queuing theory and special theory of traffic phenomena. Relation between traffic models and traffic flow management. |
| 17ILO | Information Technology in Logistics | Z,ZK | 4 | Basics of bar code technology. Basics of radiofrequency identification. Product numbering systems for intensive distribution. Packaging hierarchy and identification models in supply chain. Identification of trading partners in the supply chain. Basics of data communication in logistics. National and global multidisciplinary standards for electronic data interchange. ERP Systems used in retail and fast moving consumer goods. |
| 17LGY | Logistics Systems | Z,ZK | 6 | Transport in logistics, intermodal transport, electronic toll systems in road transport, supply chain management, logistics partnership and alliances, logistic service of territory, dangerous goods in logistics, management and marketing in logistics, identification systems in logistics, IT in logistic systems and transportation. |
| 17PJM | Project Management | ZK | 2 | Project and planning, project content, management and project task organization. Technical and economical assessment criterions. Criterion function and its components. Organization and management of the project run. |
| 11MME | Mathematical Models in Economics | KZ | 2 | Stochastic processes and their classification, Poisson process, birth and death process, queueing models and their classification, graph and related terminology, cycles in a graph and their detection, the shortest and longest way through a graph, critical path through a graph, extreme of a function of many arguments, free and constrained extremum, Lagrange multipliers, numerical methods in optimization, linear programming and its application. |
| 12DZP | Transport and Environment | Z | 2 | This course aims the impact of transport on environment. The accent is put mainly on noise and vibration, emission, barrier effect and energy demands. The noise measury is part and parcel of this course. |
| 15J2A1 | Language - English 1 | Z | 2 | Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of English and practical application, formal and technical registers and their use, language of management. |
| 15J2S1 | Language - Spanish 1 | Z | 2 | Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management. |

Code of the group: 2.S.NPTR 11/12

Name of the group: 2.sem.nav.prez.TR od 11/12

Requirement credits in the group: In this group you have to gain 19 credits

Requirement courses in the group: In this group you have to complete 6 courses

Credits in the group: 19

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) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|--------|--|------------|---------|-----------|----------|------|
| 17INV | Investments and Financing in Transport | Z,ZK | 4 | 3+1 | L | P |
| 17TTH | Transport Theory | Z,ZK | 5 | 2+2 | L | P |
| 20STL | Satellite Technologies and Logistics | Z,ZK | 4 | 2+2 | L | P |
| 16TAJ | Technological Aspects of Quality | Z | 2 | 2P+0C | L | P |
| 15JBA2 | Language - English 2 | Z | 2 | 0P+2C+10B | L | P |
| 15JBS2 | Language - Spanish 2 | Z | 2 | 0P+2C+10B | L | P |

Characteristics of the courses of this group of Study Plan: Code=2.S.NPTR 11/12 Name=2.sem.nav.prez.TR od 11/12

| | | | | |
|-------|--|------|---|--|
| 17INV | Investments and Financing in Transport | Z,ZK | 4 | Projects and project planning, project financing, financing models, PPP financing, selection procedure, EIA study, project assessment and its criterions, NPV, IRR. Optimal variant selection. Zone planning and decision making. |
| 17TTH | Transport Theory | Z,ZK | 5 | Elements of theory of graphs. Minimum spanning tree, trees in graphs. Paths and cycles. Arc routing problems. Vehicle routing problems. Network flows. Location problems. Transportation elements. Transportation flows. Theory of displacement quality. Multicriterial decision making in transport processes. |
| 20STL | Satellite Technologies and Logistics | Z,ZK | 4 | Basic topics: GPS and Galileo navigation systems and their use for positioning the rail, air, sea, road and urban transport; GIS technology as a powerful tool for solving problems in logistics, appropriate telecommunication technologies and technologies for the identification and monitoring of goods; life cycle of satellite systems, satellite as the carrier of satellite systems functionalities and its technology. |

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|---|----------------------------------|---|---|
| 16TAJ | Technological Aspects of Quality | Z | 2 |
| Certification and accreditation, quality management, standards of quality management and its application, quality system creation, tools and methods of quality improvement, conformity assurance, environmental certification, workplace certification, QMS integration, classification, certification of products and producers. | | | |
| 15JBA2 | Language - English 2 | Z | 2 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of English and practical application, formal and technical registers and their use, language of management. | | | |
| 15JBS2 | Language - Spanish 2 | Z | 2 |
| Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management. | | | |

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 4

The role of the block: PV

Code of the group: Y2-NTR 11/12

Name of the group: PVP nav.prez. TR od 11/12

Requirement credits in the group: In this group you have to gain 4 credits

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

Credits in the group: 4

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) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|----------|--|------------|---------|-------|----------|------|
| 23Y2AE | Acoustics and Electroacoustics in Transportation | KZ | 2 | 2+0 | Z | PV |
| 22Y2TAPN | Analysis and Prevention of Traffic Accidents | KZ | 2 | 2+0 | | PV |
| 20Y2AP | Computer Systems Architecture | KZ | 2 | 2+0 | L | PV |
| 20Y2BE | Safety and Reliability in Transportation | KZ | 2 | 2+0 | | PV |
| 12Y2BM | Safety on The Local Roads | KZ | 2 | 2P+0C | Z | PV |
| 17Y2BU | Stock Market and Investment Companies | KZ | 2 | 2+0 | L | PV |
| 14Y2C1 | CATIA I | KZ | 2 | 2P+0C | L | PV |
| 14Y2C2 | CATIA II | KZ | 2 | 2P+0C | Z | PV |
| 14Y2CS | Sensitivity of Systems | KZ | 2 | 2P+0C | L | PV |
| 17Y2DT | Taxes and Fees in Transport and Telecommunications | KZ | 2 | 2+0 | L | PV |
| 13Y2DT | Taxes and Fees in Transport and Telecommunications | KZ | 2 | 2+0 | L | PV |
| 17Y2DL | Transportation Logistics | KZ | 2 | 2+0 | Z | PV |
| 14Y2TDMS | Traffic Modeling and Simulation | KZ | 2 | 2+0 | | PV |
| 15Y2DN | Transportation Psychology in German Speaking Countries | KZ | 2 | 2P+0C | L | PV |
| 18Y2D2 | Dynamics of Transport Routes and Vehicles 2 | KZ | 2 | 2+0 | L | PV |
| 20Y2EMI | Economy and Management of ITS Projects | KZ | 2 | 2+0 | L | PV |
| 20Y2TEMI | Economics and Management of ITS projects | KZ | 2 | 2+0 | L | PV |
| 17Y2FM | Financing in Urban Mass Transportation <i>Václav Baroch</i> | KZ | 2 | 2P+0C | Z | PV |
| 11Y2FX | Functions of Complex Variable | KZ | 2 | 2P+0C | Z | PV |
| 18Y2FZ | Physical foundation of materials' properties | KZ | 2 | 2P+0C | L | PV |
| 15Y2HS | Road Transport History | KZ | 2 | 2P+0C | L | PV |
| 20Y2HI | ITS Effectiveness Assessment | KZ | 2 | 2+0 | | PV |
| 16Y2HP | Vehicle Hygiene | KZ | 2 | 2P+0C | L | PV |
| 13Y2IM | Investment and Insurance Mathematics | KZ | 2 | 2+0 | L | PV |
| 12Y2IS | Urban Networks | KZ | 2 | 2P+0C | Z | PV |
| 14Y2JM | One-Chip Controllers | KZ | 2 | 2P+0C | Z | PV |
| 17Y2KI | Capital Investment in Transportation and Telecommunications | KZ | 2 | 2+0 | L | PV |
| 16Y2KV | Car Body Design | KZ | 2 | 2P+0C | L | PV |
| 12Y2KS | Rail Transport in Settlements and Regions <i>Miroslav Veliš</i> | KZ | 2 | 2P+0C | Z | PV |

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|--------|---|----|---|-------|---|----|
| 12Y2KE | Landscape Ecology <i>Kristýna Neubergová</i> | KZ | 2 | 2P+0C | Z | PV |
| 21Y2LZ | Human Resources and Projects in Aviation | KZ | 2 | 2+0 | L | PV |
| 11Y2LG | Logics of Engineer's Judgement | KZ | 2 | 2P+0C | L | PV |
| 13Y2MC | Management of Travel Services Transportation | KZ | 2 | 2+0 | Z | PV |
| 13Y2MV | Management of Transportation Quality | KZ | 2 | 2+0 | L | PV |
| 13Y2MZ | Environmental Management | KZ | 2 | 2+0 | Z | PV |
| 15Y2MS | Sociology for Managers <i>Eva Rezlerová, Martina Šmidochová</i> | KZ | 2 | 2P+0C | Z | PV |
| 12Y2MH | Measurement and Modeling of Traffic Noise | KZ | 2 | 2P+0C | L | PV |
| 12Y2MD | Methods of Traffic Regulation and Prediction | KZ | 2 | 2P+0C | L | PV |
| 20Y2MK | Quality Tools in the Development Phase | KZ | 2 | 2+0 | L | PV |
| 17Y2MS | Microsimulation of Railway Operation <i>Zdeněk Michl</i> | KZ | 2 | 2P+0C | Z | PV |
| 21Y2MS | Aerospace Engineering Simulation and Modelling | KZ | 2 | 2P+0C | Z | PV |
| 12Y2MZ | Modernization of Railway Lines and Stations | KZ | 2 | 2P+0C | L | PV |
| 13Y2NU | Cost and Benefits of Transport Systems | KZ | 2 | 2+0 | L | PV |
| 21Y2NR | Navigation and Flight Control Systems | KZ | 2 | 2+0 | L | PV |
| 20Y2NE | Design of Experiments in the Development Phase | KZ | 2 | 2+0 | L | PV |
| 23Y2NE | Design of Electronic Equipments | KZ | 2 | 2+0 | L | PV |
| 14Y2OP | Object Oriented Programming in Transport | KZ | 2 | 2P+0C | L | PV |
| 12Y2OO | Protection of the Nature and Waste Management | KZ | 2 | 2+0 | L | PV |
| 15Y2OZ | Health Protection in Transportation and EU <i>Eva Rezlerová, Petr Musil</i> | KZ | 2 | 2P+0C | Z | PV |
| 12Y2PB | Navigation, Waterway Transport and Facilities | KZ | 2 | 2+0 | L | PV |
| 16Y2PG | Computer Graphics and Virtual Reality | KZ | 2 | 2P+0C | Z | PV |
| 22Y2PS | Traffic Accidents Computer Simulation and Analysis | KZ | 2 | 2P+0C | L | PV |
| 17Y2P | Insurance Business | KZ | 2 | 2+0 | L | PV |
| 15Y2PT | Food in Transportation | KZ | 2 | 2P+0C | L | PV |
| 15Y2PS | Practical Spanish for Transportation, Management and Business | KZ | 2 | 2+0 | Z | PV |
| 21Y2PP | Law and Operation in Air Transport | KZ | 2 | 2P+0C | L | PV |
| 20Y2PR | Prediction of time series | KZ | 2 | 2P+0C | L | PV |
| 14Y2PI | Process Information Systems in Transportation | KZ | 2 | 2P+0C | Z | PV |
| 14Y2PJ | C++ Programming Language | KZ | 2 | 2P+0C | L | PV |
| 14Y2PH | CAD Interface Programming | KZ | 2 | 2P+0C | L | PV |
| 21Y2PL | Operational Aspects of Aerodromes <i>Viktor Šýkora Viktor Šýkora</i> | KZ | 2 | 2P+0C | Z | PV |
| 17Y2PR | Carriage Processes | KZ | 2 | 2+0 | Z | PV |
| 17Y2PS | Case Studies in Transportation | KZ | 2 | 2P+0C | Z | PV |
| 13Y2PS | Case Studies in Transportation | KZ | 2 | 2+0 | Z | PV |
| 15Y2PU | Publications and Their Creation | KZ | 2 | 2P+0C | Z | PV |
| 12Y2RD | Realization of Transport Buildings | KZ | 2 | 2P+0C | L | PV |
| 17Y2RS | Regional Transport - Mobility of Small Towns | KZ | 2 | 2+0 | Z | PV |
| 17Y2RZ | Control of Transport Processes <i>Edvard Bežina</i> | KZ | 2 | 2P+0C | Z | PV |
| 15Y2SP | Seminar on Political Philosophy <i>Eva Rezlerová</i> | KZ | 2 | 2P+0C | Z | PV |
| 16Y2ST | Special Technologies in Transport and Telecommunications | KZ | 2 | 2P+0C | L | PV |
| 18Y2SD | Reliability and Diagnostics, Experimental Methods <i>Daniel Kytý</i> | KZ | 2 | 2P+0C | Z | PV |
| 15Y2SR | Stylistics and Rhetorics | KZ | 2 | 2P+0C | Z | PV |
| 17Y2SG | Systematic Creating of Railway Timetables | KZ | 2 | 2+0 | Z | PV |
| 17Y2SK | Urban and Regional Rail Transport System | KZ | 2 | 2P+0C | L | PV |
| 15Y2TS | Technician and Contemporary Society | KZ | 2 | 2P+0C | L | PV |
| 20Y2TE | Technology of Electronic Systems | KZ | 2 | 2P+0C | Z | PV |
| 14Y2TU | Telecommunications Systems and Multimedia | KZ | 2 | 2P+0C | Z | PV |
| 11Y2TF | Theoretical Physics at Transportation | KZ | 2 | 2+0 | | PV |

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|---------|---|----|---|----------|---|----|
| 16Y2TT | Transportation and Building Technology and Equipment | KZ | 2 | 2P+0C | Z | PV |
| 21Y2TL | Development Trends of Aircraft Construction | KZ | 2 | 2+0 | Z | PV |
| 12Y2UD | Sustainable Transportation | KZ | 2 | 2P+0C | L | PV |
| 14Y2UI | Artificial Intelligence | KZ | 2 | 2P+0C+8B | Z | PV |
| 14Y2UES | Artificial Intelligence and Expert Systems in Transport | KZ | 2 | 2+0 | L | PV |
| 20Y2UA | Artificial Neural Networks, Realization and Applications | KZ | 2 | 2P+0C | Z | PV |
| 18Y2UB | Accident Biomechanics and Safety | KZ | 2 | 2P+0C | L | PV |
| 23Y2VZ | Leadership and Human Resource Development | KZ | 2 | 2P+0C | L | PV |
| 21Y2VA | Selected Chapters of Aerodynamics | KZ | 2 | 2P+0C+8B | L | PV |
| 23Y2VS | Negotiation and Cooperation | KZ | 2 | 2+0 | Z | PV |
| 18Y2VC | Computational Mechanics in Transportation | KZ | 2 | 2P+0C | L | PV |
| 12Y2VT | High Speed Railways | KZ | 2 | 2P+0C | Z | PV |
| 12Y2ZK | Traffic Calming <i>Zuzana arská</i> | KZ | 2 | 2P+0C | Z | PV |

Characteristics of the courses of this group of Study Plan: Code=Y2-NTR 11/12 Name=PVP nav.prez. TR od 11/12

| | | | | | | |
|--|---|----|---|--|--|--|
| 23Y2AE | Acoustics and Electroacoustics in Transportation | KZ | 2 | | | |
| Basic acoustic quantities, properties of acoustic signals. Basic equations in acoustics, method of equivalent circuits. Acoustic impedance, damping. Acoustic actuators, loudspeakers. Acoustic sensors, microphones. Fundamentals of acoustic signal processing. Acoustics of closed spaces. Fundamentals of acoustics in solids. Acoustic problems in transport and their solutions. | | | | | | |
| 22Y2TAPN | Analysis and Prevention of Traffic Accidents | KZ | 2 | | | |
| 20Y2AP | Computer Systems Architecture | KZ | 2 | | | |
| Description of computer architecture principles, e.g. von Neumann's model, pipelining, different coupling of systems, transmission protocols, systolic systems, parallel systems classification, etc. The Amdahl's law, effectiveness of parallel systems performance measurement, RISC and CICS architectures, superscalar architectures, mass parallel architectures and symmetric multiprocessing explained on many examples. | | | | | | |
| 20Y2BE | Safety and Reliability in Transportation | KZ | 2 | | | |
| 12Y2BM | Safety on The Local Roads | KZ | 2 | | | |
| Classification of road accidents rates, social losses. Collision points, diagrams. Tools and methods for safer road transportation. Crossroads from the point of view of safety. Psychological right of way. Roundabouts. Pedestrian transport, cyclists. Traffic lights coordination. Transport control and regulation. | | | | | | |
| 17Y2BU | Stock Market and Investment Companies | KZ | 2 | | | |
| The course will teach the students to understand the financial and capital markets, especially the financial system, market determination of discount rates, money-market analysis and valuation of securities. Investor liquidity. Investment companies, its types, management and performance measuring of a portfolio, agiotage and arbitrage. The investment instruments, volatility and risks. | | | | | | |
| 14Y2C1 | CATIA I | KZ | 2 | | | |
| Fundamentals of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric structure, parametric linking, making adaptive models from 2D sketches. Import and export of made parts and bodies. Making assemble and visualization. | | | | | | |
| 14Y2C2 | CATIA II | KZ | 2 | | | |
| Extension of basic course. Modeling compound bodies. Possibility of enumeration, communications with other systems. Surface x solid bodies. Kinematic mechanism. Project making and project cooperation. Outputs of projects. | | | | | | |
| 14Y2CS | Sensitivity of Systems | KZ | 2 | | | |
| Design of systems with defined reliability. The impact of changing parameters and subsystems within a system. System sensitivity computing, definition of sensitivity functions and matrices and their usability in system design. | | | | | | |
| 17Y2DT | Taxes and Fees in Transport and Telecommunications | KZ | 2 | | | |
| System of taxes and fees of the Czech Republic, comparison with customs in the EU. Purpose and kinds of taxes, fundamental terms and tax categories. National budget, duties, state, local and court fees. Historic development of rates of taxation of natural individual, legal entity, VAT, consumption tax. | | | | | | |
| 13Y2DT | Taxes and Fees in Transport and Telecommunications | KZ | 2 | | | |
| System of taxes and fees of the Czech Republic, comparison with customs in the EU. Purpose and kinds of taxes, fundamental terms and tax categories. National budget, duties, state, local and court fees. Historic development of rates of taxation of natural individual, legal entity, VAT, consumption tax. | | | | | | |
| 17Y2DL | Transportation Logistics | KZ | 2 | | | |
| Position of the transportation in logistic systems. Methods of optimal management and allocation of the material flows. Decision processes in material and information flows management. Quality of transportation in logistic system, optimization of the quality level in view of shipment affinity. Role and function of information flows in logistic systems. Projection of information, diagnostic and decision systems in logistics. | | | | | | |
| 14Y2TDMS | Traffic Modeling and Simulation | KZ | 2 | | | |
| 15Y2DN | Transportation Psychology in German Speaking Countries | KZ | 2 | | | |
| Introduction into broader view of traffic problems with regard to the work with texts (Physics for drivers, abusing alcohol during driving, exhaustion, getting of driving licence, children in traffic, traffic accident, traffic psychology in the internet etc.) | | | | | | |
| 18Y2D2 | Dynamics of Transport Routes and Vehicles 2 | KZ | 2 | | | |
| Analysis of forces in the vehicle and transport routes and their influence on the stress and strain components of the vehicle structure or behavior of traffic routes. Creation of dynamic models of vehicles and transport routes. Vibration of systems with a finite number of degrees of freedom. Methods of constant stiffness and constant compliance. Dynamic calculations of structural systems. Criteria for the admissibility of oscillation. | | | | | | |
| 20Y2EMI | Economy and Management of ITS Projects | KZ | 2 | | | |
| The course presents basic theoretical knowledge for ITS effectiveness assesment in a lot of typical projects. The course covers methodology to obtain economy and financial models and their mutual synthesis to provide basis for feasibility studies for ITS implementation. It includes basic methods of project management with respect to the organizational and legislative aspects of ITS projects. | | | | | | |
| 20Y2TEMI | Economics and Management of ITS projects | KZ | 2 | | | |

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| 17Y2FM | Financing in Urban Mass Transportation | KZ | 2 |
| UMT history and development in Prague and other cities in the world. Building and operation of public tram, bus, and trolleybus networks. Underground building and operation. Other UMT types. UMT development in small towns. Particularities of investment and operation financing of individual UMT types. Historic and present models of UMT financing. Transport inspection and blind passengers. Tourism & UMT. UMT typology & choice of optimum financing. | | | |
| 11Y2FX | Functions of Complex Variable | KZ | 2 |
| Derivation of complex function, holomorphic function, complex exponential series, integration, Cauchy theorem. Taylor series, Laurent series of complex variable function. Basics of Laplace and Z-transformation. | | | |
| 18Y2FZ | Physical foundation of materials' properties | KZ | 2 |
| Atomistic models, lattice defects influence on properties of materials, stiffness, plasticity, strength, fracture, fatigue, creep, corrosion, effects of environment and loading on materials' behavior are the main discussed topics. | | | |
| 15Y2HS | Road Transport History | KZ | 2 |
| Roads and road traffic in the Ancient Age, corridors of main medieval pathways. Development of road traffic in the modern period, acceleration of road transport development during 1st part of 20th century. Development of road layout, geometric and construction layers. Beginning of modern road civil engineering. Development of road travelling in modern period. History of road intercessions, bridges and traffic control, development of road signs. | | | |
| 20Y2HI | ITS Effectiveness Assessment | KZ | 2 |
| 16Y2HP | Vehicle Hygiene | KZ | 2 |
| Emissions and ergonomoy of vehicles and the influence on man and nature. National and international law related to the hygiene. Noise and vibrations - sources, creation, propagation, physical values, ways of measuring, prevention, elimination. Exhausts - creation, measurement, reduction, non-regular fuels and drives. Ergonomoy - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredom. | | | |
| 13Y2IM | Investment and Insurance Mathematics | KZ | 2 |
| Interest rata nominal, efficient and real. Annuity, cash flow, present and future value. Debt amortization. Investment assessment. Security pricing. Basic notions and principles of insurance. Casualty insurance - risks, tariff groups, drivers, premium. Basics of demography, life tables, commutation functions. Capital life insurance, endowment, whole life. Annuity insurance. Current premium, gross premium, premium reserves. | | | |
| 12Y2IS | Urban Networks | KZ | 2 |
| The importance and the position of UN as public and technical infrastructure / utilities, methodology of the UN master planning, of UN design, UN coordination, UN installation and UN operation (basic technical standards of UN, trenchless technologies for UN). | | | |
| 14Y2JM | One-Chip Controllers | KZ | 2 |
| One-chip controllers architecture, embedded peripherals (counters, timers, converters, ports) and their utilisation. Practical tasks are programmed with the aid of AVR chips. | | | |
| 17Y2KI | Capital Investment in Transportation and Telecommunications | KZ | 2 |
| Financial market, investment desicion making - long term goals and investment strategies, long temr financing. | | | |
| 16Y2KV | Car Body Design | KZ | 2 |
| Personal cars body, high-load car body, bus car body, and motorcycle as a construction set. Principles of design, production, testing and operation. Materials used for car body construction. Active and passive safety parts. Ergonomics, HMI, view out of the vehicle, operational extent, view behind the car. Conditioning tools, signaling function. Aerodynamics of the car body. Design and artistic design principles. Practical training. | | | |
| 12Y2KS | Rail Transport in Settlements and Regions | KZ | 2 |
| Modernization and development of railway infrastructure in Czech Republic. Arrangement of railway networks and junctions. Suburban railway services. Network configuration and operation of metro systems. Network configuration and operation of tram systems. Special thematic lectures (rail transport in selected countries / regions). | | | |
| 12Y2KE | Landscape Ecology | KZ | 2 |
| Landscape ecology. Landscape - definition, types, evolution. Landscape systems. Anthropogenic impacts on landscape. Methods using for evaluating landscape. Fractal geometry and its potential applications in landscape ecology. Landscape planning. | | | |
| 21Y2LZ | Human Recources and Projects in Aviation | KZ | 2 |
| Human resource strategy and policy, the HR specifics in aviation, managers´ and specialists´ competence in HR development, management and development of HR performance, the corporate culture, HR in the conditions of global market and competition, new trends and approaches to HR development. Project management as a current practice in the current conditions of corporate management. The philosophy and principles, of project management. | | | |
| 11Y2LG | Logics of Engineer's Judgement | KZ | 2 |
| Logical structure of engineer's judgement, its propositional and predicative logical base. Solutions of logical tasks through the methods of truthfulness and semantic analysis charts. Venn's diagram method. Logical basis for network design for the solution of technical tasks. | | | |
| 13Y2MC | Management of Travel Services Transportation | KZ | 2 |
| Global importance of the tourist trade, transport services, accomodation services, catering services, guide sevice, spa services, organization and services of travel agencies, marketing and specifics of services in the tourist trade. | | | |
| 13Y2MV | Management of Transportation Quality | KZ | 2 |
| Quality management, standards and quality standardization, quality management systems, quality management in transport and logistics, marketing and transport quality, quality costs, quality measurement and monitoring, statistics in quality management, improving, focus on the customer. | | | |
| 13Y2MZ | Environmental Management | KZ | 2 |
| Delimitation of basic concepts (difference between the environment and ecology, ecosystems, sustatinable development). Main ways of environment deterioration with local, regional and global impact. Ways of environment protection, the development of the environmental policy, its strategy and instruments. Voluntary instruments, their importance and classification. Application of the most important voluntary instruments in the practice. | | | |
| 15Y2MS | Sociology for Managers | KZ | 2 |
| Sociological approach to a corporation. Corporation and its organization. Corporation and its running - human role and communication. Corporation, its culture and social system. Human's work position in free market economy. Corporate directorship, work groups, adaptation, strife, different roles and positions in corporation. | | | |
| 12Y2MH | Measurement and Modeling of Traffic Noise | KZ | 2 |
| Theoretical introduction to noise from traffic. Noise from rail transport. Noise from road traffic. Measurement and calculation of noise from rail traffic. Measurement and calculation of noise from road traffic. Modelling of traffic noise in the CADNA A. | | | |
| 12Y2MD | Methods of Traffic Regulation and Prediction | KZ | 2 |
| Basic ways of traffic prognosis, traffic prognosis for large area (calculation of future traffic volumes, calculation of future traffic volumes between areas (analogical and synthetic methods, modal split, traffic distribution to road network). Shock wave in traffic flow. Service levels and their traffic volumes. Acceleration noise. | | | |
| 20Y2MK | Quality Tools in the Development Phase | KZ | 2 |
| Overview of quality management methods, data acquisition and analysis of customer requirements, methods, QFD, DFM, DFA, DFS. FMEA (Analysis of defects and their consequences). Introduction to concurrent (team) design. | | | |

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| 17Y2MS | Microsimulation of Railway Operation | KZ | 2 |
| Introduction to the characteristics of simulation tools, creation of a simulation model of railway infrastructure, verification of a specific operational concept on the given infrastructure, adaptation of the infrastructure model and modification to the infrastructure to allow the implementation of the proposed operational concept. Stability tests and evaluations. Evaluation of sensitivity of the operational concept to delays. | | | |
| 21Y2MS | Aerospace Engineering Simulation and Modelling | KZ | 2 |
| The course is designed as a set of exemplary tasks and problems based on practical aviation issues. The university degree mathematic skills and software applications usage will be necessary for successful figuring out. Both simple tasks, where students create own model themselves (e.g. in Matlab), and more complicated problems where professional developed tools will be applied. | | | |
| 12Y2MZ | Modernization of Railway Lines and Stations | KZ | 2 |
| Line speed increasing. AGC and AGTC Agreement. AGC and AGTC railway network. Principles of modernization (conceptual papers, definitions of basic concepts, individual principles). Track geometrical characteristics on modernized railway lines. Superstructure and substructure on upgraded lines. Designing of railway stations. Bridges and tunnels. Development and realization of projects. Technical description of the tranzit corridors. | | | |
| 13Y2NU | Cost and Benefits of Transport Systems | KZ | 2 |
| Transport systems and their history, externalities and their internalization, public goods, transport funding, assessment of transport constructions and systems by the methods CBA, MCA, CA, transport taxation, influence of transport constructions on public budgets, relation of transport and economic growth, importance of transport in area, spatial economy. | | | |
| 21Y2NR | Navigation and Flight Control Systems | KZ | 2 |
| Navigation (ANP/RNP), area navigation, FMS, FMC, A/P, A/T, FD, MCDU, GPWS. | | | |
| 20Y2NE | Design of Experiments in the Development Phase | KZ | 2 |
| The role of experiment in the development of cars. A detailed overview of their own methods. Applied Statistics. Laboratory tests of durability, performance, road tests, climatic tests, acoustic tests, vibration, corrosion testing, analysis of customer satisfaction, specific expert system for the VDS, the relationship with FMEA (failure mode and effect analysis). | | | |
| 23Y2NE | Design of Electronic Equipments | KZ | 2 |
| Characteristics and realization of semiconductor electronic components, basic electronic devices division. Sources, input and output elements, process elements. Realization of basic circuits - amplifiers, data converters. Analog electronic systems, analog computing. Switching elements, logic circuits, FPGA implementation. Single chip microcomputers and microcontrollers. Design (ORCAD), construction of electronic devices. | | | |
| 14Y2OP | Object Oriented Programming in Transport | KZ | 2 |
| Class, object, encapsulation, inheritance, polymorphism, templates, retying, stream, exceptions, repository, collections, virtual methods and classes. Problem cases will be chosen from microscopic simulation system, discrete event simulation, celular automata simulation and virtual life area. | | | |
| 12Y2OO | Protection of the Nature and Waste Management | KZ | 2 |
| History of nature protection, its evaluating. Protected species, protected zones. Legislation. Landscape planning. Waste management. Production of waste and its types. Domestic waste, industrial waste, dangerous waste, toxic waste. Solid waste disposal and sorted waste. Composting. Nuclear waste and nuclear waste dump. Legislation. | | | |
| 15Y2OZ | Health Protection in Transportation and EU | KZ | 2 |
| Health protection in transportation in CR in the past and present. Conditions before 1989 and after, current legislature, future prospects. Harmonisation of legislation with other EU members. Fundamental principles of health protection and support in selected EU countries. | | | |
| 12Y2PB | Navigation, Waterway Transport and Facilities | KZ | 2 |
| Characterization of water transport, water transport facilities and principals of their construction. Lock chambers, lifts and ports. Vessels and waterways navigation. Legal order related to inland navigation and its integration to European norms. International relations in inland navigation and waterways. | | | |
| 16Y2PG | Computer Graphics and Virtual Reality | KZ | 2 |
| Principles of creation and processing of bitmap and vector 2D graphics, 3D virtual scenes and algorithms used for their computerized processing. Adopting skills of work with professional and freeware tools for creation and processing of 2D, 3D and interactive graphics, and basics of programming language VRML and graphic libraries (OpenGL). | | | |
| 22Y2PS | Traffic Accidents Computer Simulation and Analysis | KZ | 2 |
| Vehicle dynamics simulation, multi body systems and vehicle active safety systems, vehicle slipping, external influence on virtual model, crash tests evaluation, single-track vehicle, vehicle passengers, pedestrian, traffic accident simulation and analysis. | | | |
| 17Y2P | Insurance Bussiness | KZ | 2 |
| Insurance bussiness - history and progress. Insurance company, insurance - sorts. Risks and damages. Reinsurance company, principle of reinsurance. | | | |
| 15Y2PT | Food in Transportation | KZ | 2 |
| The nutrition policy. Interaction transportation and foodstuffs. The health risks. Hygienic safeguard. The practical examples from the Czech Republic and from the world. The issues of dining cars, work trains and other railroad equipment. Legislation. | | | |
| 15Y2PS | Practical Spanish for Transportation, Management and Business | KZ | 2 |
| Development of communication skills, training of correct written expression of formal character, basic technical vocabulary, cultural specifics of the Spanish speaking countries. Terminology of transport and commerce, business letter. | | | |
| 21Y2PP | Law and Operation in Air Transport | KZ | 2 |
| Development of aviation law. International conventions on civil aviation. International organisations and including of the Czech Republic in these organisations. EU legislation and civil aviation. Execution of state administration and state supervision in matters of civil aviation, in accordance with Act No. 49/1997 Col. Facilitation. Responsibilities of air carriers for passengers, luggage and cargo. The safe transport of dangerous goods. | | | |
| 20Y2PR | Prediction of time series | KZ | 2 |
| Introduction to time series prediction, meaning of prediction, basics of quantitative prediction. Methods for predictive quality evaluation, descriptive statistics, MAE, MAPE, RMSE, naive prediction, prediction for general formula of loss function. Calculation and programming environment R. Regression models, basics of linear regression, simple regression. Multiple regression, statistical tests of linear dependence, selection of input variables. | | | |
| 14Y2PI | Process Information Systems in Transportation | KZ | 2 |
| Introduction and detailed usage of transport information systems, e.g. EFC, ePurse and transport check-in systems for public transport with focus on architecture of this system and SOA (Service Oriented Architecture). Inforamtion systems implementation and operations description in the Czech Republic (technical and process) included lectures and visits. | | | |
| 14Y2PJ | C++ Programming Language | KZ | 2 |
| OOP philosophy and basics of C++ programming language. Class, object, constructor, destructor, inheritance, abstract class, virtual methods, exceptions, streams, method and operator overloading, abstract data type implementation in C++. | | | |
| 14Y2PH | CAD Interface Programming | KZ | 2 |
| Introduction to CAD interface programming techniques with the help of LIST and VBA programming languages. Possibilities of proper objects (commands), dialogues, interfaces, and applications creation in CAD systems. Programming of cooperation with other applications (databases, spread-sheets). | | | |
| 21Y2PL | Operational Aspects of Aerodromes | KZ | 2 |
| Operational aspects of aerodromes. Location of aerodrome and orientation of runways. Requirements for apron. Capacity of airports runways and terminals. Operation under winter conditions. Firefighting units. Protection against unlawful interference. Local transport connection. Environmental protection. | | | |

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| 17Y2PR | Carriage Processes | KZ | 2 |
| Carrier's commercial liability. Ordering and contracting of carriage. Intergovernmental conventions on international carriage. Contract on passenger carriage. Contract on freight carriage. Forwarding contract. Liability and rights based on carrying contract. Contractual carrying conditions. Guarantee of carrying contract by more operators. Internationally accepted commercial terms (INCOTERMS). Tariff and calculation of prices. | | | |
| 17Y2PS | Case Studies in Transportation | KZ | 2 |
| Simulation expert discussions on the topics - the impact of transport on the environment and the economy, energy, construction of transport infrastructure etc. The students will each lesson presented one current and the real issue, which solutions will have to think of each other. Each of them will be represent another role (public authorities, investors, carrier representative interest groups, residents, etc.). | | | |
| 13Y2PS | Case Studies in Transportation | KZ | 2 |
| Definition of basic concepts in transport, traffic impacts on the environment and national economy, problems of energy and transport sustainability from an energy standpoint, the relationship of transport and macroeconomic development, investments in transport, the individual chapters will be presented to students through case studies and subsequent discussions, the lectures using practitioners. | | | |
| 15Y2PU | Publications and Their Creation | KZ | 2 |
| Scientific texts types. Footnotes and references. Exploration of facts. Quotations. Formal document layout. Working with information databases. Typographic principles. Typographic editors - MS Word, Tex/LaTeX. Practical creation of simple scientific documents. | | | |
| 12Y2RD | Realization of Transport Buildings | KZ | 2 |
| Transport Buildings Types. Project Documentation Types. Building Code. Land Permission and Building Permission Process. Building Process. Project Economics. Project Management. | | | |
| 17Y2RS | Regional Transport - Mobility of Small Towns | KZ | 2 |
| Basic terms, networks of railway and bus lines, alternative forms of regional transport, influence in regional transport in vicinity of big cities, solutions of passenger and freight transport in regions, activities related to regional transport, passenger transport safety in regions. | | | |
| 17Y2RZ | Control of Transport Processes | KZ | 2 |
| Theoretical bases, transport system, decomposition, factors influencing control, quality diagnosis, methods of control, systems for decision making support, risk of decision making, telematics. | | | |
| 15Y2SP | Seminar on Political Philosophy | KZ | 2 |
| Interpreting of philosophical texts, view of society, state and their system of government. | | | |
| 16Y2ST | Special Technologies in Transport and Telecommunications | KZ | 2 |
| Micro, nano and special technologies, electric arc and its applications, plasma technologies, dipping, beam technologies, electron beams technology in roduction and mending of vehicles, laser and laser technologies, soldering, gluing, ultrasound, diffusion, friction and explosion technologies, micro stoves, gas. | | | |
| 18Y2SD | Reliability and Diagnostics, Experimental Methods | KZ | 2 |
| The course is focused on theoretical background and practical experience in the field of reliability of constructions, implementation of diagnostic procedures for the detection of material defects and determination of residual life of structures. For this purpose, non-destructive methods of experimental mechanics (e. g. strain-gauge measurement, photoelasticimetry) and optical methods, including electron microscopy, will be used. | | | |
| 15Y2SR | Stylistics and Rhetorics | KZ | 2 |
| Basic skills of oral and written expression as a means of human communication. Basic information about speech, articulation, oral and written language. Teaching to speak well-vocal organs, voice training. Language semantics, language syntactic and the pragmatic aspect. Creative thought and its oral and written expression. Practice - cultivating the skills of speech. | | | |
| 17Y2SG | Systematic Creating of Railway Timetables | KZ | 2 |
| Timetable samples. Capacity allocation, technological intervals in railway operation. Rules and regulations of train paths, running times, time adds and supplements. Rolling stock and crew circulation planning. Rules of train-diagramm creating. Train-diagramm construction in case of more service-levels on the line. | | | |
| 17Y2SK | Urban and Regional Rail Transport System | KZ | 2 |
| Factors influencing transport demand, modal-split, traffic flows distribution on public transit network. Line network optimization and configuration. Timetable designing and evaluation acceting integrated periodic timetable. Rolling stock circulation, staff and crew services optimization and their order to rosters. Framework legislation, non-barrier effects and preference of public transport. Marketing. | | | |
| 15Y2TS | Technician and Contemporary Society | KZ | 2 |
| Why to take off a hat in a room and open a door for a lady, are there simple solutions, science vs belief, do we need to know or is it enough to turn on a PC, it must be true - it's on the Internet and in newspapers, what are the sights for, interest in public affairs - a hangover from the past? | | | |
| 20Y2TE | Technology of Electronic Systems | KZ | 2 |
| Principle technologies for an effective operation of electronically controlled systems. Maintaining, meassuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologiesusers and operators. | | | |
| 14Y2TU | Telecommunications Systems and Multimedia | KZ | 2 |
| New trends in telecommunications namely applied in transport solutions, identification and quantification of telecommunications networks and services performance based on redundant architecture, provisioning of guaranteed service quality, two generations of the handover principles. | | | |
| 11Y2TF | Theoretical Physics at Transportation | KZ | 2 |
| 16Y2TT | Transportation and Building Technology and Equipment | KZ | 2 |
| Transportation and building technology and equipment. Transport of solid and mass material, soil and rock above all. Highway and underground constructions. Transport surface vehicles, description and construction features, delivered mass calculation, economy of operation. Technics and technology of underground constructions. Terrestrial vehicles operation management methodology (ultrasound, laser, GPS, total stations). | | | |
| 21Y2TL | Development Trends of Aircraft Construction | KZ | 2 |
| Historical and nowadays trends. Future scenarios. Space industry. Economy. | | | |
| 12Y2UD | Sustainable Transportation | KZ | 2 |
| Sustainable development, definition, history, legal framework. Sustainable development indicators. Sustainable transportation, definition, history, legal framework. Practical application of sustainable development theory, case study. | | | |
| 14Y2UI | Artificial Intelligence | KZ | 2 |
| History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning. | | | |
| 14Y2UES | Artificial Intelligence and Expert Systems in Transport | KZ | 2 |
| Introduction to artificial intelligence, work in unified state space and with related techniques. | | | |
| 20Y2UA | Artificial Neural Networks, Realization and Applications | KZ | 2 |
| History of neural networks. Basic principles. Comparing the structure of a natural and an artificial neuron. Neural classifiers, predictors, compresors, expanders and other specialised functional blocs and systems. Modelling of neurons. Grossberg's equations. Learning principles. Leyered and Hopfield's nets. | | | |
| 18Y2UB | Accident Biomechanics and Safety | KZ | 2 |
| Anatomy of man. Methods of Medical Diagnostics - RTG, CT, MRI, US. Dynamics of traumatic events. Factors influencing the severity of an accident and the extent of a traffic accident. Injuries in road traffic. Pedestrian injuries. Injury in railway and air traffic accidents. Analysis of biomechanical events in accidents and their computational modeling. Principles of treatment and rehabilitation. Protective elements and safety measures in transport. | | | |

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| 23Y2VZ | Leadership and Human Resource Development | KZ | 2 |
| Introduction to the study of human resources, human resources management, corporate goals, strategies, cultural and ethical aspects. Team management, communication in teams, strategy and planning in human resources, ethics and corporate culture, cross-cultural differences. The labor code. Introduction into protocols. | | | |
| 21Y2VA | Selected Chapters of Aerodynamics | KZ | 2 |
| Physical properties of real gases, atmosphere, aeronautical applications of external and internal aerodynamics, compressible internal flow, inlet nozzles and drive nozzles, compressible external flow, supercritical wings and profiles, vertical and oblique shock wave, energy losses, aeronautical aerodynamic profiles of wings, propellers, blades gratings, lift, drag, polar, viscosity, laminar and turbulent flow, boundary layer. | | | |
| 23Y2VS | Negotiation and Cooperation | KZ | 2 |
| Negotiation principles. Negotiation sense, base, essence. Business and crisis negotiation differences. The "Win-Win" principle. Specification. Credibility. Negotiation behavior principles. Negotiation and command. Team variability. Formal and informal team roles. | | | |
| 18Y2VC | Computational Mechanics in Transportation | KZ | 2 |
| Principle of virtual work and variational principles in FEM. Bar shaped, planar and three - dimensional structures in FEM. FEM in statics and in dynamics of transportational systems. Elastic, elastoplastic and viscoelastic material. FEM in problems of biomechanics. Numerical analysis of structural parts with programme ANSYS on instances. | | | |
| 12Y2VT | High Speed Railways | KZ | 2 |
| High speed rail (HSR) transport characteristics and position in transportation system. HSR vehicles types and characteristics and control-command and signalling system. HSR system interoperability. Non-adhesion HSR systems. City traffic service by HSR. HSR operating points. HSR worldwide network. HSR routing and traffic conception. Specifics of HSR track construction and geometrical characteristics. | | | |
| 12Y2ZK | Traffic Calming | KZ | 2 |
| Principles of traffic calming. Solution of road network organization. Urban road layouts. Psychological and physical obstacles (measures of traffic calming) and their combinations. Traffic calming measures in crossroads. Pedestrian zones. Residential streets and zones. | | | |

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|--|--|------------|---------|
| 11MME | Mathematical Models in Economics | KZ | 2 |
| Stochastic processes and their classification, Poisson process, birth and death process, queueing models and their classification, graph and related terminology, cycles in a graph and their detection, the shortest and longest way through a graph, critical path through a graph, extreme of a function of many arguments, free and constrained extremum, Lagrange multipliers, numerical methods in optimization, linear programming and its application. | | | |
| 11XN1 | Master Project 1 | Z | 2 |
| 11XN2 | Master Project 2 | Z | 2 |
| 11Y2FX | Functions of Complex Variable | KZ | 2 |
| Derivation of complex function, holomorphic function, complex exponential series, integration, Cauchy theorem. Taylor series, Laurent series of complex variable function. Basics of Laplace and Z-transformation. | | | |
| 11Y2LG | Logics of Engineer's Judgement | KZ | 2 |
| Logical structure of engineer's judgement, its propositional and predicative logical base. Solutions of logical tasks through the methods of truthfulness and semantic analysis charts. Venn's diagram method. Logical basis for network design for the solution of technical tasks. | | | |
| 11Y2TF | Theoretical Physics at Transportation | KZ | 2 |
| 12DZP | Transport and Environment | Z | 2 |
| This course aims the impact of transport on environment. The accent is put mainly on noise and vibration, emission, barrier effect and energy demands. The noise measure is part and parcel of this course. | | | |
| 12TDP | Traffic Flow Theory | Z,ZK | 3 |
| Mobility and associated human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamentals and applications of mathematical models. Macroscopic, statistical and microscopic models. Theory of shock waves, queueing theory and special theory of traffic phenomena. Relation between traffic models and traffic flow management. | | | |
| 12XN1 | Master Project 1 | Z | 2 |
| 12XN2 | Master Project 2 | Z | 2 |
| 12Y2BM | Safety on The Local Roads | KZ | 2 |
| Classification of road accidents rates, social losses. Collision points, diagrams. Tools and methods for safer road transportation. Crossroads from the point of view of safety. Psychological right of way. Roundabouts. Pedestrian transport, cyclists. Traffic lights coordination. Transport control and regulation. | | | |
| 12Y2IS | Urban Networks | KZ | 2 |
| The importance and the position of UN as public and technical infrastructure / utilities, methodology of the UN master planning, of UN design, UN coordination, UN installation and UN operation (basic technical standards of UN, trenchless technologies for UN). | | | |
| 12Y2KE | Landscape Ecology | KZ | 2 |
| Landscape ecology. Landscape - definition, types, evolution. Landscape systems. Anthropogenic impacts on landscape. Methods using for evaluating landscape. Fractal geometry and its potential applications in landscape ecology. Landscape planning. | | | |
| 12Y2KS | Rail Transport in Settlements and Regions | KZ | 2 |
| Modernization and development of railway infrastructure in Czech Republic. Arrangement of railway networks and junctions. Suburban railway services. Network configuration and operation of metro systems. Network configuration and operation of tram systems. Special thematic lectures (rail transport in selected countries / regions). | | | |
| 12Y2MD | Methods of Traffic Regulation and Prediction | KZ | 2 |
| Basic ways of traffic prognosis, traffic prognosis for large area (calculation of future traffic volumes, calculation of future traffic volumes between areas (analogical and synthetic methods, modal split, traffic distribution to road network). Shock wave in traffic flow. Service levels and their traffic volumes. Acceleration noise. | | | |
| 12Y2MH | Measurement and Modeling of Traffic Noise | KZ | 2 |
| Theoretical introduction to noise from traffic. Noise from rail transport. Noise from road traffic. Measurement and calculation of noise from rail traffic. Measurement and calculation of noise from road traffic. Modelling of traffic noise in the CADNA A. | | | |

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| 12Y2MZ | Modernization of Railway Lines and Stations | KZ | 2 |
| Line speed increasing. AGC and AGTC Agreement. AGC and AGTC railway network. Principles of modernization (conceptual papers, definitions of basic concepts, individual principles). Track geometrical characteristics on modernized railway lines. Superstructure and substructure on upgraded lines. Designing of railway stations. Bridges and tunnels. Development and realization of projects. Technical description of the transit corridors. | | | |
| 12Y2OO | Protection of the Nature and Waste Management | KZ | 2 |
| History of nature protection, its evaluating. Protected species, protected zones. Legislation. Landscape planning. Waste management. Production of waste and its types. Domestic waste, industrial waste, dangerous waste, toxic waste. Solid waste disposal and sorted waste. Composting. Nuclear waste and nuclear waste dump. Legislation. | | | |
| 12Y2PB | Navigation, Waterway Transport and Facilities | KZ | 2 |
| Characterization of water transport, water transport facilities and principals of their construction. Lock chambers, lifts and ports. Vessels and waterways navigation. Legal order related to inland navigation and its integration to European norms. International relations in inland navigation and waterways. | | | |
| 12Y2RD | Realization of Transport Buildings | KZ | 2 |
| Transport Buildings Types. Project Documentation Types. Building Code. Land Permission and Building Permission Process. Building Process. Project Economics. Project Management. | | | |
| 12Y2UD | Sustainable Transportation | KZ | 2 |
| Sustainable development, definition, history, legal framework. Sustainable development indicators. Sustainable transportation, definition, history, legal framework. Practical application of sustainable development theory, case study. | | | |
| 12Y2VT | High Speed Railways | KZ | 2 |
| High speed rail (HSR) transport characteristics and position in transportation system. HSR vehicles types and characteristics and control-command and signalling system. HSR system interoperability. Non-adhesion HSR systems. City traffic service by HSR. HSR operating points. HSR worldwide network. HSR routing and traffic conception. Specifics of HSR track construction and geometrical characteristics. | | | |
| 12Y2ZK | Traffic Calming | KZ | 2 |
| Principles of traffic calming. Solution of road network organization. Urban road layouts. Psychological and physical obstacles (measures of traffic calming) and their combinations. Traffic calming measures in crossroads. Pedestrian zones. Residential streets and zones. | | | |
| 13XN1 | Master Project 1 | Z | 2 |
| 13XN2 | Master Project 2 | Z | 2 |
| 13Y2DT | Taxes and Fees in Transport and Telecommunications | KZ | 2 |
| System of taxes and fees of the Czech Republic, comparison with customs in the EU. Purpose and kinds of taxes, fundamental terms and tax categories. National budget, duties, state, local and court fees. Historic development of rates of taxation of natural individual, legal entity, VAT, consumption tax. | | | |
| 13Y2IM | Investment and Insurance Mathematics | KZ | 2 |
| Interest rate nominal, efficient and real. Annuity, cash flow, present and future value. Debt amortization. Investment assessment. Security pricing. Basic notions and principles of insurance. Casualty insurance - risks, tariff groups, drivers, premium. Basics of demography, life tables, commutation functions. Capital life insurance, endowment, whole life. Annuity insurance. Current premium, gross premium, premium reserves. | | | |
| 13Y2MC | Management of Travel Services Transportation | KZ | 2 |
| Global importance of the tourist trade, transport services, accommodation services, catering services, guide services, spa services, organization and services of travel agencies, marketing and specifics of services in the tourist trade. | | | |
| 13Y2MV | Management of Transportation Quality | KZ | 2 |
| Quality management, standards and quality standardization, quality management systems, quality management in transport and logistics, marketing and transport quality, quality costs, quality measurement and monitoring, statistics in quality management, improving, focus on the customer. | | | |
| 13Y2MZ | Environmental Management | KZ | 2 |
| Delimitation of basic concepts (difference between the environment and ecology, ecosystems, sustainable development). Main ways of environment deterioration with local, regional and global impact. Ways of environment protection, the development of the environmental policy, its strategy and instruments. Voluntary instruments, their importance and classification. Application of the most important voluntary instruments in the practice. | | | |
| 13Y2NU | Cost and Benefits of Transport Systems | KZ | 2 |
| Transport systems and their history, externalities and their internalization, public goods, transport funding, assessment of transport constructions and systems by the methods CBA, MCA, CA, transport taxation, influence of transport constructions on public budgets, relation of transport and economic growth, importance of transport in area, spatial economy. | | | |
| 13Y2PS | Case Studies in Transportation | KZ | 2 |
| Definition of basic concepts in transport, traffic impacts on the environment and national economy, problems of energy and transport sustainability from an energy standpoint, the relationship of transport and macroeconomic development, investments in transport, the individual chapters will be presented to students through case studies and subsequent discussions, the lectures using practitioners. | | | |
| 14XN1 | Master Project 1 | Z | 2 |
| 14XN2 | Master Project 2 | Z | 2 |
| 14Y2C1 | CATIA I | KZ | 2 |
| Fundamentals of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric structure, parametric linking, making adaptive models from 2D sketches. Import and export of made parts and bodies. Making assemble and visualization. | | | |
| 14Y2C2 | CATIA II | KZ | 2 |
| Extension of basic course. Modeling compound bodies. Possibility of enumeration, communications with other systems. Surface x solid bodies. Kinematic mechanism. Project making and project cooperation. Outputs of projects. | | | |
| 14Y2CS | Sensitivity of Systems | KZ | 2 |
| Design of systems with defined reliability. The impact of changing parameters and subsystems within a system. System sensitivity computing, definition of sensitivity functions and matrices and their usability in system design. | | | |
| 14Y2JM | One-Chip Controllers | KZ | 2 |
| One-chip controllers architecture, embedded peripherals (counters, timers, converters, ports) and their utilisation. Practical tasks are programmed with the aid of AVR chips. | | | |
| 14Y2OP | Object Oriented Programming in Transport | KZ | 2 |
| Class, object, encapsulation, inheritance, polymorphism, templates, retying, stream, exceptions, repository, collections, virtual methods and classes. Problem cases will be chosen from microscopic simulation system, discrete event simulation, cellular automata simulation and virtual life area. | | | |
| 14Y2PH | CAD Interface Programming | KZ | 2 |
| Introduction to CAD interface programming techniques with the help of LIST and VBA programming languages. Possibilities of proper objects (commands), dialogues, interfaces, and applications creation in CAD systems. Programming of cooperation with other applications (databases, spread-sheets). | | | |
| 14Y2PI | Process Information Systems in Transportation | KZ | 2 |
| Introduction and detailed usage of transport information systems, e.g. EFC, ePurse and transport check-in systems for public transport with focus on architecture of this system and SOA (Service Oriented Architecture). Information systems implementation and operations description in the Czech Republic (technical and process) included lectures and visits. | | | |

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| 14Y2PJ | C++ Programming Language OOP philosophy and basics of C++ programming language. Class, object, constructor, destructor, inheritance, abstract class, virtual methods, exceptions, streams, method and operator overloading, abstract data type implementation in C++. | KZ | 2 |
| 14Y2TDM | Traffic Modeling and Simulation | KZ | 2 |
| 14Y2TU | Telecommunications Systems and Multimedia New trends in telecommunications namely applied in transport solutions, identification and quantification of telecommunications networks and services performance based on redundant architecture, provisioning of guaranteed service quality, two generations of the handover principles. | KZ | 2 |
| 14Y2UES | Artificial Intelligence and Expert Systems in Transport Introduction to artificial intelligence, work in unified state space and with related techniques. | KZ | 2 |
| 14Y2UI | Artificial Intelligence History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning. | KZ | 2 |
| 15J2A1 | Language - English 1 Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of English and practical application, formal and technical registers and their use, language of management. | Z | 2 |
| 15J2S1 | Language - Spanish 1 Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management. | Z | 2 |
| 15JBA2 | Language - English 2 Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of English and practical application, formal and technical registers and their use, language of management. | Z | 2 |
| 15JBS2 | Language - Spanish 2 Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management. | Z | 2 |
| 15XN1 | Master Project 1 | Z | 2 |
| 15XN2 | Master Project 2 | Z | 2 |
| 15Y2DN | Transportation Psychology in German Speaking Countries Introduction into broader view of traffic problems with regard to the work with texts (Physics for drivers, abusing alcohol during driving, exhaustion, getting of driving licence, children in traffic, traffic accident, traffic psychology in the internet etc.) | KZ | 2 |
| 15Y2HS | Road Transport History Roads and road traffic in the Ancient Age, corridors of main medieval pathways. Development of road traffic in the modern period, acceleration of road transport development during 1st part of 20th century. Development of road layout, geometric and construction layers. Beginning of modern road civil engineering. Development of road travelling in modern period. History of road intercections, bridges and traffic control, development of road signs. | KZ | 2 |
| 15Y2MS | Sociology for Managers Sociological approach to a corporation. Corporation and its organization. Corporation and its running - human role and communication. Corporation, its culture and social system. Human's work position in free market economy. Corporate directorship, work groups, adaptation, strife, different roles and positions in corporation. | KZ | 2 |
| 15Y2OZ | Health Protection in Transportation and EU Health protection in transportation in CR in the past and present. Conditions before 1989 and after, current legislature, future prospects. Harmonisation of legislation with other EU members. Fundamental principles of health protection and support in selected EU countries. | KZ | 2 |
| 15Y2PS | Practical Spanish for Transportation, Management and Business Development of communication skills, training of correct written expression of formal character, basic technical vocabulary, cultural specifics of the Spanish speaking countries. Terminology of transport and commerce, business letter. | KZ | 2 |
| 15Y2PT | Food in Transportation The nutrition policy. Interaction transportation and foodstuffs. The health risks. Hygienic safeguard. The practical examples from the Czech Republic and from the world. The issues of dining cars, work trains and other railroad equipment. Legislation. | KZ | 2 |
| 15Y2PU | Publications and Their Creation Scientific texts types. Footnotes and references. Exploration of facts. Quotations. Formal document layout. Working with information databases. Typographic principles. Typographic editors - MS Word, Tex/LaTeX. Practical creation of simple scientific documents. | KZ | 2 |
| 15Y2SP | Seminar on Political Philosophy Interpreting of philosophical texts, view of society, state and their system of government. | KZ | 2 |
| 15Y2SR | Stylistics and Rhetorics Basic skills of oral and written expression as a means of human communication. Basic information about speech, articulation, oral and written language. Teaching to speak well-vocal organs, voice training. Language semantics, language syntactic and the pragmatic aspect. Creative thought and its oral and written expression. Practice - cultivating the skills of speech. | KZ | 2 |
| 15Y2TS | Technician and Contemporary Society Why to take off a hat in a room and open a door for a lady, are there simple solutions, science vs belief, do we need to know or is it enough to turn on a PC, it must be true - it's on the Internet and in newspapers, what are the sights for, interest in public affairs - a hangover from the past? | KZ | 2 |
| 16TAJ | Technological Aspects of Quality Certification and accreditation, quality management, standards of quality management and its application, quality system creation, tools and methods of quality improvement, conformity assurance, environmental certification, workplace certification, QMS integration, classification, certification of products and producers. | Z | 2 |
| 16XN1 | Master Project 1 | Z | 2 |
| 16XN2 | Master Project 2 | Z | 2 |
| 16Y2HP | Vehicle Hygiene Emissions and ergonomy of vehicles and the influence on man and nature. National and international law related to the hygiene. Noise and vibrations - sources, creation, propagation, physical values, ways of measuring, prevention, elimination. Exhausts - creation, measurement, reduction, non-regular fuels and drives. Ergonomy - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredom. | KZ | 2 |

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| 16Y2KV | Car Body Design Personal cars body, high-load car body, bus car body, and motorcycle as a construction set. Principles of design, production, testing and operation. Materials used for car body construction. Active and passive safety parts. Ergonomics, HMI, view out of the vehicle, operational extent, view behind the car. Conditioning tools, signaling function. Aerodynamics of the car body. Design and artistic design principles. Practical training. | KZ | 2 |
| 16Y2PG | Computer Graphics and Virtual Reality Principles of creation and processing of bitmap and vector 2D graphics, 3D virtual scenes and algorithms used for their computerized processing. Adopting skills of work with professional and freeware tools for creation and processing of 2D, 3D and interactive graphics, and basics of programming language VRML and graphic libraries (OpenGL). | KZ | 2 |
| 16Y2ST | Special Technologies in Transport and Telecommunications Micro, nano and special technologies, electric arc and its applications, plasma technologies, dipping, beam technologies, electron beams technology in roduction and mending of vehicles, laser and laser technologies, soldering, gluing, ultrasound, diffusion, friction and explosion technologies, micro stoves, gas. | KZ | 2 |
| 16Y2TT | Transportation and Building Technology and Equipment Transportation and building technology and equipment. Transport of solid and mass material, soil and rock above all. Highway and underground constructions. Transport surface vehicles, description and construction features, delivered mass calculation, economy of operation. Technics and technology of underground constructions. Terrestrial vehicles operation management methodology (ultrasound, laser, GPS, total stations). | KZ | 2 |
| 17ILO | Information Technology in Logistics Basics of bar code technology. Basics of radiofrequency identification. Product numbering systems for intensive distribution. Packaging hierarchy and identification models in supply chain. Identification of trading partners in the supply chain. Basics of data communication in logistics. National and global multidisciplinary standards for electronic data interchange. ERP Systems used in retail and fast moving consumer goods. | Z,ZK | 4 |
| 17INV | Investments and Financing in Transport Projects and project planning, project financing, financing models, PPP financing, selection procedure, EIA study, project assessment and its criterions, NPV, IRR. Optimal variant selection. Zone planning and decision making. | Z,ZK | 4 |
| 17LGY | Logistics Systems Transport in logistics, intermodal transport, electronic toll systems in road transport, supply chain management, logistics partnership and alliances, logistic service of territory, dangerous goods in logistics, management and marketing in logistics, identification systems in logistics, IT in logistic systems and transportation. | Z,ZK | 6 |
| 17PJM | Project Management Project and planning, project content, management and project task organization. Technical and economical assessment criterions. Criterion function and its components. Organization and management of the project run. | ZK | 2 |
| 17TTH | Transport Theory Elements of theory of graphs. Minimum spanning tree, trees in graphs. Paths and cycles. Arc routing problems. Vehicle routing problems. Network flows. Location problems. Transportation elements. Transportation flows. Theory of displacement quality. Multicriterial decision making in transport processes. | Z,ZK | 5 |
| 17XN1 | Master Project 1 | Z | 2 |
| 17XN2 | Master Project 2 | Z | 2 |
| 17Y2BU | Stock Market and Investment Companies The course will teach the students to understand the financial and capital markets, especially the financial system, market determination of discount rates, money-market analysis and valuation of securities. Investor liquidity. Investment companies, its types, management and performance measuring of a portfolio, agiotage and arbitrage. The investment instruments, volatility and risks. | KZ | 2 |
| 17Y2DL | Transportation Logistics Position of the transportation in logistic systems. Methods of optimal management and allocation of the material flows. Decision processes in material and information flows management. Quality of transportation in logistic system, optimization of the quality level in view of shipment affinity. Role and function of information flows in logistic systems. Projection of information, diagnostic and decision systems in logistics. | KZ | 2 |
| 17Y2DT | Taxes and Fees in Transport and Telecommunications System of taxes and fees of the Czech Republic, comparison with customs in the EU. Purpose and kinds of taxes, fundamental terms and tax categories. National budget, duties, state, local and court fees. Historic development of rates of taxation of natural individual, legal entity, VAT, consumption tax. | KZ | 2 |
| 17Y2FM | Financing in Urban Mass Transportation UMT history and development in Prague and other cities in the world. Building and operation of public tram, bus, and trolleybus networks. Underground building and operation. Other UMT types. UMT development in small towns. Particularities of investment and operation financing of individual UMT types. Historic and present models of UMT financing. Transport inspection and blind passengers. Tourism & UMT. UMT typology & choice of optimum financing. | KZ | 2 |
| 17Y2KI | Capital Investment in Transportation and Telecommunications Financial market, investment desicion making - long term goals and investment strategies, long temr financing. | KZ | 2 |
| 17Y2MS | Microsimulation of Railway Operation Introduction to the characteristics of simulation tools, creation of a simulation model of railway infrastructure, verification of a specific operational concept on the given infrastructure, adaptation of the infrastructure model and modification to the infrastructure to allow the implementation of the proposed operational concept. Stability tests and evaluations. Evaluation of sensitivity of the operational concept to delays. | KZ | 2 |
| 17Y2P | Insurance Bussiness Insurance bussiness - history and progress. Insurance company, insurance - sorts. Risks and damages. Reinsurance company, principle of reinsurance. | KZ | 2 |
| 17Y2PR | Carriage Processes Carrier's commercial liability. Ordering and contracting of carriage. Intergovernmental conventions on international carriage. Contract on passenger carriage. Contract on freight carriage. Forwarding contract. Liability and rights based on carrying contract. Contractual carrying conditions. Guarantee of carrying contract by more operators. Internationally accepted commercial terms (INCOTERMS). Tariff and calculation of prices. | KZ | 2 |
| 17Y2PS | Case Studies in Transportation Simulation expert discussions on the topics - the impact of transport on the environment and the economy, energy, construction of transport infrastructure etc. The students will each lesson presented one current and the real issue, which solutions will have to think of each other. Each of them will be represent another role (public authorities, investors, carrier representative interest groups, residents, etc.). | KZ | 2 |
| 17Y2RS | Regional Transport - Mobility of Small Towns Basic terms, networks of railway and bus lines, alternative forms of regional transport, influence in regional transport in vicinity of big cities, solutions of passenger and freight transport in regions, activities related to regional transport, passenger transport safety in regions. | KZ | 2 |
| 17Y2RZ | Control of Transport Processes Theoretical bases, transport system, decomposition, factors influencing control, quality diagnosis, methods of control, systems for decision making support, risk of decision making, telematics. | KZ | 2 |

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| 17Y2SG | Systematic Creating of Railway Timetables | KZ | 2 |
| Timetable samples. Capacity allocation, technological intervals in railway operation. Rules and regulations of train paths, running times, time adds and supplements. Rolling stock and crew circulation planning. Rules of train-diagramm creating. Train-diagramm construction in case of more service-levels on the line. | | | |
| 17Y2SK | Urban and Regional Rail Transport System | KZ | 2 |
| Factors influencing transport demand, modal-split, traffic flows distribution on public transit network. Line network optimization and configuration. Timetable designing and evaluation accenting integrated periodic timetable. Rolling stock circulation, staff and crew services optimization and their order to rosters. Framework legislation, non-barrier effects and preference of public transport. Marketing. | | | |
| 18XN1 | Master Project 1 | Z | 2 |
| 18XN2 | Master Project 2 | Z | 2 |
| 18Y2D2 | Dynamics of Transport Routes and Vehicles 2 | KZ | 2 |
| Analysis of forces in the vehicle and transport routes and their influence on the stress and strain components of the vehicle structure or behavior of traffic routes. Creation of dynamic models of vehicles and transport routes. Vibration of systems with a finite number of degrees of freedom. Methods of constant stiffness and constant compliance. Dynamic calculations of structural systems. Criteria for the admissibility of oscillation. | | | |
| 18Y2FZ | Physical foundation of materials' properties | KZ | 2 |
| Atomistic models, lattice defects influence on properties of materials, stiffness, plasticity, strength, fracture, fatigue, creep, corrosion, effects of environment and loading on materials' behavior are the main discussed topics. | | | |
| 18Y2SD | Reliability and Diagnostics, Experimental Methods | KZ | 2 |
| The course is focused on theoretical background and practical experience in the field of reliability of constructions, implementation of diagnostic procedures for the detection of material defects and determination of residual life of structures. For this purpose, non-destructive methods of experimental mechanics (e. g. strain-gauge measurement, photoelasticity) and optical methods, including electron microscopy, will be used. | | | |
| 18Y2UB | Accident Biomechanics and Safety | KZ | 2 |
| Anatomy of man. Methods of Medical Diagnostics - RTG, CT, MRI, US. Dynamics of traumatic events. Factors influencing the severity of an accident and the extent of a traffic accident. Injuries in road traffic. Pedestrian injuries. Injury in railway and air traffic accidents. Analysis of biomechanical events in accidents and their computational modeling. Principles of treatment and rehabilitation. Protective elements and safety measures in transport. | | | |
| 18Y2VC | Computational Mechanics in Transportation | KZ | 2 |
| Principle of virtual work and variational principles in FEM. Bar shaped, planar and three - dimensional structures in FEM. FEM in statics and in dynamics of transportation systems. Elastic, elastoplastic and viscoelastic material. FEM in problems of biomechanics. Numerical analysis of structural parts with programme ANSYS on instances. | | | |
| 20STL | Satellite Technologies and Logistics | Z,ZK | 4 |
| Basic topics: GPS and Galileo navigation systems and their use for positioning the rail, air, sea, road and urban transport; GIS technology as a powerful tool for solving problems in logistics, appropriate telecommunication technologies and technologies for the identification and monitoring of goods; life cycle of satellite systems, satellite as the carrier of satellite systems functionalities and its technology. | | | |
| 20XN1 | Master Project 1 | Z | 2 |
| 20XN2 | Master Project 2 | Z | 2 |
| 20Y2AP | Computer Systems Architecture | KZ | 2 |
| Description of computer architecture principles, e.g. von Neumann's model, pipelining, different coupling of systems, transmission protocols, systolic systems, parallel systems classification, etc. The Amdahl's law, effectiveness of parallel systems performance measurement, RISC and CICS architectures, superscalar architectures, mass parallel architectures and symmetric multiprocessing explained on many examples. | | | |
| 20Y2BE | Safety and Reliability in Transportation | KZ | 2 |
| 20Y2EMI | Economy and Management of ITS Projects | KZ | 2 |
| The course presents basic theoretical knowledge for ITS effectiveness assesment in a lot of typical projects. The course covers methodology to obtain economy and financial models and their mutual synthesis to provide basis for feasibility studies for ITS implementation. It includes basic methods of project management with respect to the organizational and legislative aspects of ITS projects. | | | |
| 20Y2HI | ITS Effectiveness Assessment | KZ | 2 |
| 20Y2MK | Quality Tools in the Development Phase | KZ | 2 |
| Overview of quality management methods, data acquisition and analysis of customer requirements, methods, QFD, DFM, DFA, DFS. FMEA (Analysis of defects and their consequences). Introduction to concurrent (team) design. | | | |
| 20Y2NE | Design of Experiments in the Development Phase | KZ | 2 |
| The role of experiment in the development of cars. A detailed overview of their own methods. Applied Statistics. Laboratory tests of durability, performance, road tests, climatic tests, acoustic tests, vibration, corrosion testing, analysis of customer satisfaction, specific expert system for the VDS, the relationship with FMEA (failure mode and effect analysis). | | | |
| 20Y2PR | Prediction of time series | KZ | 2 |
| Introduction to time series prediction, meaning of prediction, basics of quantitative prediction. Methods for predictive quality evaluation, descriptive statistics, MAE, MAPE, RMSE, naive prediction, prediction for general formula of loss function. Calculation and programming environment R. Regression models, basics of linear regression, simple regression. Multiple regression, statistical tests of linear dependence, selection of input variables. | | | |
| 20Y2TE | Technology of Electronic Systems | KZ | 2 |
| Principle technologies for an effective operation of electronically controlled systems. Maintaining, meassuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologiesusers and operators. | | | |
| 20Y2TEMI | Economics and Management of ITS projects | KZ | 2 |
| 20Y2UA | Artificial Neural Networks, Realization and Applications | KZ | 2 |
| History of neural networks. Basic principles. Comparing the structure of a natural and an artificial neuron. Neural classifiers, predictors, compresors, expanders and other specialised functional blocs and systems. Modelling of neurons. Grossberg's equations. Learning principles. Layered and Hopfield's nets. | | | |
| 21XN1 | Master Project 1 | Z | 2 |
| 21XN2 | Master Project 2 | Z | 2 |
| 21Y2LZ | Human Recources and Projects in Aviation | KZ | 2 |
| Human resource strategy and policy, the HR specifics in aviation, managers' and specialists' competence in HR development, management and development of HR performance, the corporate culture, HR in the conditions of global market and competition, new trends and approaches to HR development. Project management as a current practice in the current conditions of corporate management. The philosophy and principles, of project management. | | | |
| 21Y2MS | Aerospace Engineering Simulation and Modelling | KZ | 2 |
| The course is designed as a set of exemplary tasks and problems based on practical aviation issues. The university degree mathematic skills and software applications usage will be necessary for successful figuring out. Both simple tasks, where students create own model themselves (e.g. in Matlab), and more complicated problems where professional developed tools will be applied. | | | |

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| 21Y2NR | Navigation and Flight Control Systems Navigation (ANP/RNP), area navigation, FMS, FMC, A/P, A/T, FD, MCDU, GPWS. | KZ | 2 |
| 21Y2PL | Operational Aspects of Aerodromes Operational aspects of aerodromes. Location of aerodrome and orientation of runways. Requirements for apron. Capacity of airports runways and terminals. Operation under winter conditions. Firefighting units. Protection against unlawful interference. Local transport connection. Environmental protection. | KZ | 2 |
| 21Y2PP | Law and Operation in Air Transport Development of aviation law. International conventions on civil aviation. International organisations and including of the Czech Republic in these organisations. EU legislation and civil aviation. Execution of state administration and state supervision in matters of civil aviation, in accordance with Act No. 49/1997 Col. Facilitation. Responsibilities of air carriers for passengers, luggage and cargo. The safe transport of dangerous goods. | KZ | 2 |
| 21Y2TL | Development Trends of Aircraft Construction Historical and nowadays trends. Future scenarios. Space industry. Economy. | KZ | 2 |
| 21Y2VA | Selected Chapters of Aerodynamics Physical properties of real gases, atmosphere, aeronautical applications of external and internal aerodynamics, compressible internal flow, inlet nozzles and drive nozzles, compressible external flow, supercritical wings and profiles, vertical and oblique shock wave, energy losses, aeronautical aerodynamic profiles of wings, propellers, blades gratings, lift, drag, polar, viscosity, laminar and turbulent flow, boundary layer. | KZ | 2 |
| 22XN1 | Master Project 1 | Z | 2 |
| 22XN2 | Master Project 2 | Z | 2 |
| 22Y2PS | Traffic Accidents Computer Simulation and Analysis Vehicle dynamics simulation, multi body systems and vehicle active safety systems, vehicle slipping, external influence on virtual model, crash tests evaluation, single-track vehicle, vehicle passengers, pedestrian, traffic accident simulation and analysis. | KZ | 2 |
| 22Y2TAPN | Analysis and Prevention of Traffic Accidents | KZ | 2 |
| 23XN1 | Master Project 1 | Z | 2 |
| 23XN2 | Master Project 2 | Z | 2 |
| 23Y2AE | Acoustics and Electroacoustics in Transportation Basic acoustic quantities, properties of acoustic signals. Basic equations in acoustics, method of equivalent circuits. Acoustic impedance, damping. Acoustic actuators, loudspeakers. Acoustic sensors, microphones. Fundamentals of acoustic signal processing. Acoustics of closed spaces. Fundamentals of acoustics in solids. Acoustic problems in transport and their solutions. | KZ | 2 |
| 23Y2NE | Design of Electronic Equipments Characteristics and realization of semiconductor electronic components, basic electronic devices division. Sources, input and output elements, process elements. Realization of basic circuits - amplifiers, data converters. Analog electronic systems, analog computing. Switching elements, logic circuits, FPGA implementation. Single chip microcomputers and microcontrollers. Design (ORCAD), construction of electronic devices. | KZ | 2 |
| 23Y2VS | Negotiation and Cooperation Negotiation principles. Negotiation sense, base, essence. Business and crisis negotiation differences. The "Win-Win" principle. Specification. Credibility. Negotiation behavior principles. Negotiation and command. Team variability. Formal and informal team roles. | KZ | 2 |
| 23Y2VZ | Leadership and Human Resource Development Introduction to the study of human resources, human resources management, corporate goals, strategies, cultural and ethical aspects. Team management, communication in teams, strategy and planning in human resources, ethics and corporate culture, cross-cultural differences. The labor code. Introduction into protocols. | KZ | 2 |

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