

# Study plan

## Name of study plan: BI nav.prez.11/12

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch: doc. Ing. Václav Jirovský, CSc.

Program of study: Technology in Transportation and Telecommunications

Type of study: Follow-up master full-time

Required credits: 118

Elective courses credits: 2

Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 99

The role of the block: Z

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

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

Requirement credits in the group: In this group you have to gain 26 credits

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

Credits in the group: 26

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
15J2A1	<b>Language - English 1</b> Eva Rezlerová, Dana Boušová, Jitka He manová, Marie Michlová, Lenka Monková, Markéta Olehlová, Markéta Vojanová, Peter Morpuss, Barbora Horáková	Z	2	0P+2C+10B	Z	Z
23PJC	<b>Advanced Programming in C++</b>	Z	2	0+2	Z	Z
14PEU	<b>Electronic Communications Law in EU and CR</b>	KZ	2	2+0	Z	Z
23PI	<b>Transfer of Information</b>	ZK	3	2+0	L	Z
15SFY	<b>Corporate Sociology</b>	KZ	2	2+0	Z	Z
11SFIN	<b>Software Engineering</b>	ZK	3	2+0	Z	Z
14SI	<b>System Engineering</b>	Z,ZK	4	2+1	Z	Z
20TSS	<b>Telematic Systems and Services</b>	Z,ZK	3	2+1	Z	Z
23VRZ	<b>Human Resources Management and Development</b>	ZK	3	2+0	Z	Z
23ZPM	<b>Intelligence Instruments and Methods</b>	KZ	2	2+0	Z	Z

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

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		
23PJC	Advanced Programming in C++ Types, classes and objects, objects originating and ending, abstract data types, overloading. Genetics, virtual genetics, virtual methods. Dynamic allocation, indexes, conversion. Patterns, generic programming, compilation. Polymorphism, containers, iterators, algorithms. Exceptions, secure programming with exceptions. Secure and mobile programming, OS connections.	Z	2		
14PEU	Electronic Communications Law in EU and CR Basic overview of electronic communications (telecommunications, broadcasting, ICT). Legal construction. Relation of legal instruments available in the Czech Republic to the EU regulatory framework of electronic communications 2002.	KZ	2		
23PI	Transfer of Information Theory of information - introduction. Theoretical and practical knowledge in the field of communication. Transfer ways summary. Encoding and decoding analog and numeric signals. Level architecture ISO and description of physical levels and its applications. Signal characteristics, encoding, cyclic codes, signal compressing. Analog signals modulation. Data transfer modulation. Transfer ways and networks, protocols level architecture.	ZK	3		

15SFY	Corporate Sociology	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.			
11SFIN	Software Engineering	ZK	3
Software development principles. Software as technical artifact. Software architectures. Requirements specification problems. Software life cycle. Software standards, ISO and software metrics.			
14SI	System Engineering	Z,ZK	4
Standard analysis methods and synthesis (projecting) of objects with system identification from the methodology standpoint.			
20TSS	Telematic Systems and Services	Z,ZK	3
Telematic theory, telematic architecture, FRAME, cooperative systems - technologies, principles and applications, European electronic toll service, traffic information systems, e-call, automated vehicle systems, European railway traffic management system.			
23VRZ	Human Resources Management and Development	ZK	3
Human resources management introduction. Company goals, strategy and culture. Human resources management, team management and internal communication. Human resources planning and development. Intercultural differences. Current legislation.			
23ZPM	Intelligence Instruments and Methods	KZ	2
History and present of intelligence services and their role in the modern world. Intelligence service information management. Methods and process of collection and evaluation of information. Intelligence service instruments. Internal and external intelligence. Military intelligence. State security services. Private security services and commercial intelligence. Intelligence service organization, efficiency and reliability.			

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

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

Requirement credits in the group: In this group you have to gain 22 credits

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

Credits in the group: 22

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
20APS	Computer Systems Architecture	KZ	1	0+2	L	z
20IDFS	Identification Systems	Z	2	2P+0C	L	z
15JBA2	Language - English 2	Z	2	0P+2C+10B	L	z
23OOM	Personal and property protection	ZK	2	2+0	L	z
23PDS	Advanced Database Systems	ZK	3	2+0	L	z
23PJJ	Advanced programming in JAVA	KZ	2	2+0	L	z
23PSE	Computer network	ZK	3	2+0	L	z
20SIBS	Reliability Engineering and Safety of Systems	ZK	3	2+0	L	z
23TP	Criminal Law in IT and Transportation	KZ	2	2+0	L	z
11VSM	Selected Statistical Methods	ZK	2	2+0	L	z

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

20APS	Computer Systems Architecture	KZ	1
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.			
20IDFS	Identification Systems	Z	2
Basic identification systems, its technologies (barcodes, RFID, biometrics), their features, usage, security and standards. Applications of identification systems, e.g. identification of vehicles, cargo, devices and processes. Identifier as foundation of traffic telematics standardization.			
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.			
23OOM	Personal and property protection	ZK	2
Personal and property protection, technical and organization instruments. Definition of basic principles. Danger typology. Personal and property protection legislation. Institutional security management. OECD security management principles. Super-system security adapted to an institution. Secret and personal data protection. Protection systems and intrusion risks. Physical security technical instruments. External and internal detectors. Effective response and reconstruction principles. Human, technology and infrastructure survivability principles.			
23PDS	Advanced Database Systems	ZK	3
DBS principles, individual components functions, Conceptual, physical and database approaches to the data. Database models overview. Conceptual data model. Constructs. Integrity limits expression. Relation data model. Relation database schema. Database questioning languages. Decomposition quality criterions. Transactions. Errors correction. Parallel access coordination. Data protection. Physical data model. Index. Indexed cluster. Hash cluster.			
23PJJ	Advanced programming in JAVA	KZ	2
Syntax, types, classes, interface, objects, genealogy, packets, operators. JAVA vs. C++ differences. Exceptions management: try, catch, throw orders. Field. Chains. Memory allocation. Garbage collection. Language interpreter. Environment run - time. Development instruments. Synchronization. Fibres. Basic distribution most used packets summary - group, collection, GUI, network support.			

23PSE	Computer network Network functioning principles, internet. Internet protocols - UDP, IP, TCP, ARP, http [s], ftp,SMTP/TLS, Pop[s], imap[s], ssh /scp. Network services - directing, address translation [transfer], firewalls, proxy. Network vulnerability.	ZK	3
20SIBS	Reliability Engineering and Safety of Systems Basic theory of reliability and safety with special regard to information and automation equipment used in transportation safety systems. Various aspects of reliability and safety systems analysis and synthesis. Problems of human subject - artificial systems.	ZK	3
23TP	Criminal Law in IT and Transportation Introduction of criminal law into legal order, conception of culpability and criminal delict, consequence of other legal standards. international treaty and criminal law, investigation of crime, specific indicia of criminal court cases, practical examples.	KZ	2
11VSM	Selected Statistical Methods Probability. Accident and fortuity.	ZK	2

Code of the group: 3.S.NPBI 12/13

Name of the group: 3.sem.nav.prez.BI od 12/13

Requirement credits in the group: In this group you have to gain 25 credits

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

Credits in the group: 25

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
14BSA	Software Safety - ADA	Z,ZK	6	2+2	Z	z
23BPR1	Security Training 1	KZ	4	0+2	Z	z
15JBA3	Language - English 3 Eva Režlerová, Dana Boušová, Jitka He manová, Marie Michlová, Lenka Monková, Markéta Olehlová, Markéta Vojanová, Peter Morpuss, Barbora Horáková	Z	2	0P+2C+10B	Z	z
11KZK	Encoding and Cryptology Introduction	KZ	2	2+0	Z	z
20LNS	Localization and Navigation Systems	KZ	2	2+0	Z	z
11STS	Stochastic Systems Šárka Jozová, Ivan Nagy, Evženie Uglickich, Pavla Pecherková Evženie Uglickich (Gar.)	Z,ZK	4	2P+2C+14B	Z	z
14TSYD	Telecommunications Services for Transport Applications	KZ	2	2+0	Z	z
13RZK	Crisis Management	KZ	3	2+0	Z	z

Characteristics of the courses of this group of Study Plan: Code=3.S.NPBI 12/13 Name=3.sem.nav.prez.BI od 12/13

14BSA	Software Safety - ADA Problems of safety and reliability of software, requirements to its safety and reliability in transportation applications, problems of portability and maintenance, ways of their reaching, relations to systems working in real time, safe SW design in EU standards, practical work with GNAT ADA system in exercises, formal design methods and CASE systems.	Z,ZK	6
23BPR1	Security Training 1 Depending of semester plan.	KZ	4
15JBA3	Language - English 3 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
11KZK	Encoding and Cryptology Introduction Theoretical background of ECC construction and their application to areas as data transmission (linear and binary cyclic codes) or data compression (Huffman code, LZ77, LZW). Introduction to cryptology, theoretical background and construction of different ciphers (DES, AES, RSA).	KZ	2
20LNS	Localization and Navigation Systems Main principles of localization, satellite localization, performance parameters, processing of positioning data, digital cartographic data for navigation, navigation systems, dynamical navigation systems, applications of navigation systems.	KZ	2
11STS	Stochastic Systems The subject deals with the problems of mathematical modelling of dynamical systems, estimation of these models and their utilization for prediction. The results are illustrated on practical transportation tasks. Mathematical theory roots from probability and mathematical statistics and they use the methods of the Bayesian probabilistic approach.	Z,ZK	4
14TSYD	Telecommunications Services for Transport Applications New trends in telecommunications 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
13RZK	Crisis Management Crisis situations and states of crisis. Risk of extraordinary events. Crisis management of state. Civil emergency planning. Economic mobilization. Social-psychological aspects of states of crisis. Legal aspects of activities during states of crisis. Subjects of economic mobilization. Emergency plan of economic mobilization subject.	KZ	3

Code of the group: 4.S.NPBI 12/13

Name of the group: 4.sem.nav.prez. BI od 12/13

Requirement credits in the group: In this group you have to gain 21 credits

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

Credits in the group: 21

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
23BID	Security Engineering in Distributed Systems	ZK	4	2+0	L	z
23BPR2	Security Training 2	KZ	3	0+2	L	z
20IPT	Information environment	ZK	2	2+0	L	z
15JBA4	Language - English 4	ZK	2	0P+2C+10B	L	z
23KY	Cyberality	ZK	3	2+0	L	z
23MAR	Risk Analysis and Management	Z,ZK	3	2P+1C+10B	L	z
14MTSY	Telecommunications Systems Management	KZ	2	2+0	L	z
22TZN	Technical Expertise	KZ	2	2+1	Z	z

**Characteristics of the courses of this group of Study Plan: Code=4.S.NPBI 12/13 Name=4.sem.nav.prez. BI od 12/13**

23BID	Security Engineering in Distributed Systems	ZK	4	Protocols, access management, cryptography role, distributed systems, multilevel security, multilateral security, banking and accounting systems, monitoring systems, control and command, security imprint and seals, biometry, physical security, emission security. Electronic information warfare. Net attacks and protection. Commercial system protection. Privacy protection. E - policy. Management instruments. System development and evaluation. Security standards.		
23BPR2	Security Training 2	KZ	3	Depending of semester plan.		
20IPT	Information environment	ZK	2	E - business and e - commerce environment creation, state and public information environment development in converging networks, data protection, telecommunications and information society.		
15JBA4	Language - English 4	ZK	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.		
23KY	Cyberality	ZK	3	Juridical aspects of behavior on the computer network and computer systems. Cybernetic crime technology. Theory basis and models. Cyberterrorism. Infoware and connected aspects.		
23MAR	Risk Analysis and Management	Z,ZK	3	Concept of risks and terms. Risk sources, definition of hazard, impacts and risks. Methods for identification, analysis, assessment and management of risks. Risk engineering targets and good engineering practice. Methods, tools and techniques for risk engineering. System of systems risk. Application of strategic and system approach for benefit of security and development. Territorial, emergency and crisis planning. Human factor - its role.		
14MTSY	Telecommunications Systems Management	KZ	2	New trends in the area of e-communication services and relevant ecommunications networks, conditions and tools to provide optional set of services of required parameters based on hierarchal architecture of service management system (TMN). Positioning of broadband services, convergence trends leading to NGN. Financial criteria and tools as an integral part of providing service.		
22TZN	Technical Expertise	KZ	2	Historical evolution of sworn forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report. Appraisal and its role in the forensic.		

Code of the group: XNDPB 12/13

Name of the group: Diplomová práce obor BI

Requirement credits in the group: In this group you have to gain 5 credits

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 5

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
11DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
12DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
13DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
14DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
15DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
23DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
18DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z
16DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	z

20DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	Z
21DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	Z
22DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	Z
17DPB	Diploma Thesis (for the Field BI)	Z	5	0+4	L	Z

**Characteristics of the courses of this group of Study Plan: Code=XNDPB 12/13 Name=Diplomová práce obor BI**

11DPB	Diploma Thesis (for the Field BI)	Z	5
12DPB	Diploma Thesis (for the Field BI)	Z	5
13DPB	Diploma Thesis (for the Field BI)	Z	5
14DPB	Diploma Thesis (for the Field BI)	Z	5
15DPB	Diploma Thesis (for the Field BI)	Z	5
23DPB	Diploma Thesis (for the Field BI)	Z	5
18DPB	Diploma Thesis (for the Field BI)	Z	5
16DPB	Diploma Thesis (for the Field BI)	Z	5
20DPB	Diploma Thesis (for the Field BI)	Z	5
21DPB	Diploma Thesis (for the Field BI)	Z	5
22DPB	Diploma Thesis (for the Field BI)	Z	5
17DPB	Diploma Thesis (for the Field BI)	Z	5

Name of the block: Semestrální projekt

Minimal number of credits of the block: 5

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	<b>Master Project 1</b> Ivan Nagy	Z	2	0P+2C	Z	ZP
12XN1	<b>Master Project 1</b>	Z	2	0P+2C	Z	ZP
13XN1	<b>Master Project 1</b>	Z	2	0+2	Z	ZP
14XN1	<b>Master Project 1</b> Ota Hajzler, Jana Kaliková	Z	2	0P+2C	Z	ZP
15XN1	<b>Master Project 1</b> Eva Rezlerová	Z	2	0P+2C	Z	ZP
23XN1	<b>Master Project 1</b>	Z	2	0P+2C	Z	ZP
17XN1	<b>Master Project 1</b> Václav Baroch, Edvard Bezina, Michal Drábek, Alexandra Dvořáková, Veronika Faifřová, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová, .....	Z	2	0P+2C	Z	ZP
18XN1	<b>Master Project 1</b>	Z	2	0P+2C	Z	ZP
20XN1	<b>Master Project 1</b>	Z	2	0P+2C	Z	ZP
21XN1	<b>Master Project 1</b>	Z	2	0P+2C	Z	ZP
22XN1	<b>Master Project 1</b> Michal Frydryn, Karel Kocián, Tomáš Mišuněk, Luboš Nouzovský, Zdeněk Svátý	Z	2	0P+2C	Z	ZP
16XN1	<b>Master Project 1</b> Josef Mík, Adam Orlický, Jaroslav Machan	Z	2	0P+2C	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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11XN2	Master Project 2 Ivan Nagy	Z	2	0P+2C	L	ZP
12XN2	Master Project 2	Z	2	0P+2C	L	ZP
13XN2	Master Project 2	Z	2	0+2	L	ZP
14XN2	Master Project 2	Z	2	0P+2C	L	ZP
15XN2	Master Project 2	Z	2	0P+2C	L	ZP
23XN2	Master Project 2	Z	2	0P+2C	L	ZP
17XN2	Master Project 2	Z	2	0P+2C	L	ZP
18XN2	Master Project 2	Z	2	0P+2C	L	ZP
20XN2	Master Project 2	Z	2	0P+2C	L	ZP
21XN2	Master Project 2	Z	2	0P+2C	L	ZP
22XN2	Master Project 2	Z	2	0P+2C	L	ZP
16XN2	Master Project 2	Z	2	0P+2C	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

Code of the group: XN3 12/13

Name of the group: Projekt nav.3.sem. od 12/13

Requirement credits in the group: In this group you have to gain 1 credit

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 1

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
11XN3	Master Project 3	Z	1	0P+4C	Z	ZP
12XN3	Master Project 3	Z	1	0P+4C	Z	ZP
13XN3	Master Project 3	Z	1	0+4	Z	ZP
14XN3	Master Project 3 Jana Kaliková, Tomáš Zelinka, Martin Šrotý, Zdeněk Lokaj	Z	1	0P+4C	Z	ZP
15XN3	Master Project 3 Eva Režlerová	Z	1	0P+4C	Z	ZP
23XN3	Master Project 3	Z	1	0P+4C	Z	ZP

17XN3	<b>Master Project 3</b> Václav Baroch, Edvard B ezina, Michal Drábek, Alexandra Dvo áková, Veronika Faifrová, Tomáš Horák, Vít Janoš, Milan K iž, Olga Mertlová, .....	Z	1	0P+4C	Z	ZP
18XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
20XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
21XN3	<b>Master Project 3</b> Helena Bínová	Z	1	0P+4C	Z	ZP
22XN3	<b>Master Project 3</b> Michal Frydrýn, Karel Kocián, Tomáš Mí unek, Luboš Nouzovský, Zden k Svätý	Z	1	0P+4C	Z	ZP
16XN3	<b>Master Project 3</b> Josef Mík	Z	1	0P+4C	Z	ZP

**Characteristics of the courses of this group of Study Plan: Code=XN3 12/13 Name=Projekt nav.3.sem. od 12/13**

11XN3	Master Project 3	Z	1
12XN3	Master Project 3	Z	1
13XN3	Master Project 3	Z	1
14XN3	Master Project 3	Z	1
15XN3	Master Project 3	Z	1
23XN3	Master Project 3	Z	1
17XN3	Master Project 3	Z	1
18XN3	Master Project 3	Z	1
20XN3	Master Project 3	Z	1
21XN3	Master Project 3	Z	1
22XN3	Master Project 3	Z	1
16XN3	Master Project 3	Z	1

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 6

The role of the block: PV

Code of the group: Y2-NBI 11/12

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

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

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
23Y2AE	<b>Acoustics and Electroacoustics in Transportation</b>	KZ	2	2+0	Z	PV
20Y2AP	<b>Computer Systems Architecture</b>	KZ	2	2+0	L	PV
12Y2BM	<b>Safety on The Local Roads</b>	KZ	2	2P+0C	Z	PV
17Y2BU	<b>Stock Market and Investment Companies</b>	KZ	2	2+0	L	PV
14Y2C1	<b>CATIA I</b>	KZ	2	2P+0C	L	PV
14Y2C2	<b>CATIA II</b>	KZ	2	2P+0C	Z	PV
14Y2CS	<b>Sensitivity of Systems</b>	KZ	2	2P+0C	L	PV
13Y2DT	<b>Taxes and Fees in Transport and Telecommunications</b>	KZ	2	2+0	L	PV
17Y2DT	<b>Taxes and Fees in Transport and Telecommunications</b>	KZ	2	2+0	L	PV
17Y2DL	<b>Transportation Logistics</b>	KZ	2	2+0	Z	PV
15Y2DN	<b>Transportation Psychology in German Speaking Countries</b>	KZ	2	2P+0C	L	PV
18Y2D2	<b>Dynamics of Transport Routes and Vehicles 2</b>	KZ	2	2+0	L	PV
17Y2FM	<b>Financing in Urban Mass Transportation</b> Václav Baroch	KZ	2	2P+0C	Z	PV
11Y2FX	<b>Functions of Complex Variable</b> Ond ej Navrátil	KZ	2	2P+0C	Z	PV
18Y2FZ	<b>Physical Basis of Materials' Properties</b>	KZ	2	2P+0C	L	PV
15Y2HS	<b>Road Transport History</b>	KZ	2	2P+0C	L	PV
16Y2HP	<b>Vehicle Hygiene</b>	KZ	2	2P+0C	L	PV
13Y2IM	<b>Investment and Insurance Mathematics</b>	KZ	2	2+0	L	PV

12Y2IS	<b>Urban Networks</b>	KZ	2	2P+0C	Z	PV
14Y2JM	<b>One-Chip Controllers</b> <i>Vít Fábeka</i>	KZ	2	2P+0C	Z	PV
17Y2KI	<b>Capital Investment in Transportation and Telecommunications</b>	KZ	2	2+0	L	PV
16Y2KV	<b>Car Body Design</b>	KZ	2	2P+0C	L	PV
12Y2KS	<b>Rail Transport in Settlements and Regions</b> <i>Miroslav Velíš</i>	KZ	2	2P+0C	Z	PV
12Y2KE	<b>Landscape Ecology</b> <i>Kristýna Neubergová</i>	KZ	2	2P+0C	Z	PV
21Y2LZ	<b>Human Resources and Projects in Aviation</b>	KZ	2	2+0	L	PV
11Y2LG	<b>Logics of Engineer's Judgement</b>	KZ	2	2P+0C	L	PV
13Y2MC	<b>Management of Travel Services Transportation</b>	KZ	2	2+0	Z	PV
13Y2MV	<b>Management of Transportation Quality</b>	KZ	2	2+0	L	PV
13Y2MZ	<b>Environmental Management</b>	KZ	2	2+0	Z	PV
15Y2MS	<b>Sociology for Managers</b>	KZ	2	2P+0C	Z	PV
12Y2MD	<b>Methods of Traffic Regulation and Prediction</b>	KZ	2	2P+0C	L	PV
20Y2MK	<b>Quality Tools in the Development Phase</b>	KZ	2	2+0	L	PV
17Y2MS	<b>Microsimulation of Railway Operation</b> <i>Zdeněk Michl</i>	KZ	2	2P+0C	Z	PV
21Y2MS	<b>Aerospace Engineering Simulation and Modelling</b> <i>Stanislav Pleninger</i>	KZ	2	2P+0C	Z	PV
12Y2MZ	<b>Modernization of Railway Lines and Stations</b>	KZ	2	2P+0C	L	PV
12Y2MH	<b>Measurement and Modeling of Traffic Noise</b>	KZ	2	2P+0C	L	PV
21Y2NR	<b>Navigation and Flight Control Systems</b>	KZ	2	2+0	L	PV
23Y2NE	<b>Design of Electronic Equipments</b>	KZ	2	2+0	L	PV
13Y2NU	<b>Cost and Benefits of Transport Systems</b>	KZ	2	2+0	L	PV
20Y2NE	<b>Design of Experiments in the Development Phase</b>	KZ	2	2+0	L	PV
14Y2OP	<b>Object Oriented Programming in Transport</b>	KZ	2	2P+0C	L	PV
12Y2OO	<b>Protection of the Nature and Waste Management</b>	KZ	2	2+0	L	PV
15Y2OZ	<b>Health Protection in Transportation and EU</b> <i>Eva Rezlerová, Petr Musil</i>	KZ	2	2P+0C	Z	PV
12Y2PB	<b>Navigation, Waterway Transport and Facilities</b>	KZ	2	2+0	L	PV
17Y2P	<b>Insurance Business</b>	KZ	2	2+0	L	PV
15Y2PT	<b>Food in Transportation</b>	KZ	2	2P+0C	L	PV
16Y2PG	<b>Computer Graphics and Virtual Reality</b> <i>Adam Orlický</i>	KZ	2	2P+0C	Z	PV
22Y2PS	<b>Traffic Accidents Computer Simulation and Analysis</b>	KZ	2	2P+0C	L	PV
15Y2PS	<b>Practical Spanish for Transportation, Management and Business</b>	KZ	2	2+0	Z	PV
20Y2PR	<b>Time Series Prediction</b>	KZ	2	2P+0C	L	PV
14Y2PI	<b>Process Information Systems in Transportation</b> <i>Zdeněk Lokaj</i>	KZ	2	2P+0C	Z	PV
14Y2PJ	<b>C++ Programming Language</b>	KZ	2	2P+0C	L	PV
14Y2PH	<b>CAD Interface Programming</b>	KZ	2	2P+0C	L	PV
21Y2PL	<b>Operational Aspects of Aerodromes</b> <i>Jakub Kraus, Jakub Hospodka, Viktor Sýkora</i>	KZ	2	2P+0C	Z	PV
21Y2PP	<b>Law and Operation in Air Transport</b>	KZ	2	2P+0C	L	PV
15Y2PU	<b>Publications and Their Creation</b>	KZ	2	2P+0C	Z	PV
17Y2PR	<b>Carriage Processes</b>	KZ	2	2+0	Z	PV
13Y2PS	<b>Case Studies in Transportation</b>	KZ	2	2+0	Z	PV
17Y2PS	<b>Case Studies in Transportation</b>	KZ	2	2P+0C	Z	PV
12Y2RD	<b>Realization of Transport Buildings</b>	KZ	2	2P+0C	L	PV
17Y2RS	<b>Regional Transport - Mobility of Small Towns</b>	KZ	2	2+0	Z	PV
15Y2SP	<b>Seminar on Political Philosophy</b> <i>Marek Tomek</i>	KZ	2	2P+0C	Z	PV
16Y2ST	<b>Special Technologies in Transport and Telecommunications</b>	KZ	2	2P+0C	L	PV
18Y2SD	<b>Reliability and Diagnostics, Experimental Methods</b> <i>Daniel Kytý</i>	KZ	2	2P+0C	Z	PV
15Y2SR	<b>Stylistics and Rhetorics</b> <i>Eva Rezlerová, Irena Veselková</i>	KZ	2	2P+0C	Z	PV



17Y2SG	<b>Systematic Creating of Railway Timetables</b>	KZ	2	2+0	Z	PV
17Y2SK	<b>Urban and Regional Rail Transport System</b>	KZ	2	2P+0C	L	PV
15Y2TS	<b>Technician and Contemporary Society</b>	KZ	2	2P+0C	L	PV
20Y2TE	<b>Technology of Electronic Systems</b>	KZ	2	2P+0C	Z	PV
14Y2TU	<b>Telecommunications Systems and Multimedia</b>	KZ	2	2P+0C	Z	PV
16Y2TT	<b>Transportation and Building Technology and Equipment</b>	KZ	2	2P+0C	Z	PV
21Y2TL	<b>Development Trends of Aircraft Construction</b>	KZ	2	2+0	Z	PV
12Y2UD	<b>Sustainable Transportation</b>	KZ	2	2P+0C	L	PV
14Y2UI	<b>Artificial Intelligence</b>	KZ	2	2P+0C	Z	PV
20Y2UA	<b>Artificial Neural Networks, Realization and Applications</b> <i>Mírko Novák</i>	KZ	2	2P+0C	Z	PV
23Y2VZ	<b>Leadership and Human Resource Development</b>	KZ	2	2P+0C	L	PV
21Y2VA	<b>Selected Parts of Aerodynamics</b>	KZ	2	2+0	Z	PV
23Y2VS	<b>Negotiation and Cooperation</b>	KZ	2	2+0	Z	PV
12Y2VT	<b>High Speed Railways</b> <i>Lukáš Týfa</i>	KZ	2	2P+0C	Z	PV
18Y2VC	<b>Computational Mechanics in Transportation</b>	KZ	2	2P+0C	L	PV
12Y2ZK	<b>Traffic Calming</b> <i>Zuzana arská</i>	KZ	2	2P+0C	Z	PV
18Y2UB	<b>Accident Biomechanics and Safety</b>	KZ	2	2P+0C	L	PV
17Y2RZ	<b>Control of Transport Processes</b> <i>Edvard B ezina</i>	KZ	2	2P+0C	Z	PV

### Characteristics of the courses of this group of Study Plan: Code=Y2-NBI 11/12 Name=PVP nav.prez.BI 11/12

23Y2AE	<b>Acoustics and Electroacoustics in Transportation</b>	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.					
20Y2AP	<b>Computer Systems Architecture</b>	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.					
12Y2BM	<b>Safety on The Local Roads</b>	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	<b>Stock Market and Investment Companies</b>	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	<b>CATIA I</b>	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	<b>CATIA II</b>	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	<b>Sensitivity of Systems</b>	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.					
13Y2DT	<b>Taxes and Fees in Transport and Telecommunications</b>	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.					
17Y2DT	<b>Taxes and Fees in Transport and Telecommunications</b>	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	<b>Transportation Logistics</b>	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.					
15Y2DN	<b>Transportation Psychology in German Speaking Countries</b>	KZ	2		
Introduction to larger view of the 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	<b>Dynamics of Transport Routes and Vehicles 2</b>	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.					

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 Basis of Materials' Properties	KZ	2
On the basis of internal structure and nature of interaction elastic material behavior and its maximum strength is explained. The model is further developed by considering different types of defects, loads and environment for explanation of failure mechanisms - the level of real strength determined by internal defects, and brittle fracture, fatigue and creep. Failures are discussed as a challenge posed to design of novel materials.			
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 interconnections, bridges and traffic control, development of road signs.			
16Y2HP	Vehicle Hygiene	KZ	2
Emissions and ergonomomy 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. Ergonomomy - 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 decision making - long term goals and investment strategies, long term 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 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.			
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.			
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.			
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.			
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.			
21Y2NR	Navigation and Flight Control Systems	KZ	2
Navigation (ANP/RNP), area navigation, FMS, FMC, A/P, A/T, FD, MCDU, GPWS.			
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.			
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.			
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).			
14Y2OP	Object Oriented Programming in Transport	KZ	2
Classes, objects, encapsulation, inheritance, polymorphism, templates, retying, streams, events, repository, collections, virtual methods and classes. Examples will be derived from microscopic simulation systems, discrete event simulation, cellulár simulations and virtual life simulations.			
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.			
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.			
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 passangers, pedestrian, traffic accident simulation and analysis.			
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.			
20Y2PR	Time Series Prediction	KZ	2
Basic methods of quantitative forecasting, causal models, time series. Model performance evaluation, describing statistics, MAE, MAPE, RMSE, entropy measures, naive models. Basic theory of the linear prediction models, covariance and correlation coefficients, smoothing methods, regression methods, Box-Jenkins methodology, statistical tests, genetics algorithms.			
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
Principles of object-oriented programming and C++ programming language. Basic concepts, such as - classes, objects, constructors, destructors, inheritance, virtual methods, exceptions, streams, overloading, ADT.			
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.			
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.			
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.			

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.			
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.			
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.).			
12Y2RD	Realization of Transport Buildings	KZ	2
In the first part acquainting students with preliminary to project. Preliminary to realization. Execution of a project.			
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.			
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
Reliability theory. Ultimate limit state and serviceability. Diagnosis of components and systems. Defects in materials and products. Experimental observation of the variables and mechanical phenomena. Model similarity. Non-destructive testing of materials and structures. Optical methods. Strain gauges. Experimental determination of residual stresses. Measurement errors. Evaluation experiments.			
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 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.			
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.			
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.			
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.			
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 Parts of Aerodynamics	KZ	2
Real gases physical properties, atmosphere. Fundamentals of fluid dynamics. External and internal aerodynamics in aircraft applications. Wing sections, wings, airfoil cascades, lift, drag. Polar, ideal incompressible and compressible flows. Viscous flows. Boundary layer, stability, turbulence. Reynolds, Strouhal and Mach Numbers. Flows aircraft aerodynamics and light dynamics. Static and dynamic stability. Anoeurability. Aircraft performances.			
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.			

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.			
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.			
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.			
18Y2UB	Accident Biomechanics and Safety	KZ	2
Anatomy of Man. Biomechanics of musculo-skeletal system. Medical diagnostic methods - X-ray, CT, MRI, US. Dynamics and causes of traumatic events. Pedestrian injuries. Injury accidents in road, rail and air traffic. Analysis of physical processes in terms of injury biomechanics. Principles of treatment and rehabilitation. Safety equipment and precautions to reduce the consequences of traffic accidents.			
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.			

Name of the block: Jazyky

Minimal number of credits of the block: 8

The role of the block: J

Code of the group: JZ-N-11/12

Name of the group: Jazyk nav.1.- 4.sem. 11/12

Requirement credits in the group: In this group you have to gain 8 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 8

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
15J2F1	<b>Language - French 1</b> <i>Eva Rezlerová, Irena Veselková</i>	Z	2	0P+2C+10B	Z	J
15JBF2	<b>Language - French 2</b>	Z	2	0P+2C+10B	L	J
15JBF3	<b>Language - French 3</b> <i>Eva Rezlerová, Irena Veselková</i>	Z	2	0P+2C	Z	J
15JBF4	<b>Language - French 4</b>	ZK	2	0P+2C+10B	L	J
15J2N1	<b>Language - German 1</b> <i>Eva Rezlerová, Jana Štikarová</i>	Z	2	0P+2C+10B	Z	J
15JBN2	<b>Language - German 2</b>	Z	2	0P+2C+10B	L	J
15JBN3	<b>Language - German 3</b> <i>Eva Rezlerová, Jana Štikarová</i>	Z	2	0P+2C	Z	J
15JBN4	<b>Language - German 4</b>	ZK	2	0P+2C+10B	L	J
15J2R1	<b>Language - Russian 1</b> <i>Eva Rezlerová, Marie Michlová</i>	Z	2	0P+2C+10B	Z	J
15JBR2	<b>Language - Russian 2</b>	Z	2	0P+2C+10B	L	J
15JBR3	<b>Language - Russian 3</b> <i>Eva Rezlerová, Marie Michlová</i>	Z	2	0P+2C	Z	J
15JBR4	<b>Language - Russian 4</b>	ZK	2	0P+2C+10B	L	J
15J2S1	<b>Language - Spanish 1</b> <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	0P+2C+10B	Z	J
15JBS2	<b>Language - Spanish 2</b>	Z	2	0P+2C+10B	L	J
15JBS3	<b>Language - Spanish 3</b> <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	0P+2C	Z	J
15JBS4	<b>Language - Spanish 4</b>	ZK	2	0P+2C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-N-11/12 Name=Jazyk nav.1.- 4.sem. 11/12

15J2F1	Language - French 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.			
15JBF2	Language - French 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.			

15JBF3	Language - French 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBF4	Language - French 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15J2N1	Language - German 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.			
15JBN2	Language - German 2	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBN3	Language - German 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBN4	Language - German 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15J2R1	Language - Russian 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.			
15JBR2	Language - Russian 2	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBR3	Language - Russian 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBR4	Language - Russian 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
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.			
15JBS2	Language - Spanish 2	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS3	Language - Spanish 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS4	Language - Spanish 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			

### List of courses of this pass:

Code	Name of the course	Completion	Credits
11DPB	Diploma Thesis (for the Field BI)	Z	5
11KZK	Encoding and Cryptology Introduction	KZ	2
Theoretical background of ECC construction and their application to areas as data transmission (linear and binary cyclic codes) or data compression (Huffman code, LZ77, LZW). Introduction to cryptology, theoretical background and construction of different ciphers (DES, AES, RSA).			
11SFIN	Software Engineering	ZK	3
Software development principles. Software as technical artifact. Software architectures. Requirements specification problems. Software life cycle. Software standards, ISO and software metrics.			

11STS	<b>Stochastic Systems</b>	Z,ZK	4
The subject deals with the problems of mathematical modelling of dynamical systems, estimation of these models and their utilization for prediction. The results are illustrated on practical transportation tasks. Mathematical theory roots from probability and mathematical statistics and they use the methods of the Bayesian probabilistic approach.			
11VSM	<b>Selected Statistical Methods</b>	ZK	2
Probability. Accident and fortuity.			
11XN1	<b>Master Project 1</b>	Z	2
11XN2	<b>Master Project 2</b>	Z	2
11XN3	<b>Master Project 3</b>	Z	1
11Y2FX	<b>Functions of Complex Variable</b>	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	<b>Logics of Engineer's Judgement</b>	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.			
12DPB	<b>Diploma Thesis (for the Field BI)</b>	Z	5
12XN1	<b>Master Project 1</b>	Z	2
12XN2	<b>Master Project 2</b>	Z	2
12XN3	<b>Master Project 3</b>	Z	1
12Y2BM	<b>Safety on The Local Roads</b>	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	<b>Urban Networks</b>	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	<b>Landscape Ecology</b>	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	<b>Rail Transport in Settlements and Regions</b>	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	<b>Methods of Traffic Regulation and Prediction</b>	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	<b>Measurement and Modeling of Traffic Noise</b>	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.			
12Y2MZ	<b>Modernization of Railway Lines and Stations</b>	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	<b>Protection of the Nature and Waste Management</b>	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	<b>Navigation, Waterway Transport and Facilities</b>	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	<b>Realization of Transport Buildings</b>	KZ	2
In the first part acquainting students with preliminary to project. Preliminary to realization. Execution of a project.			
12Y2UD	<b>Sustainable Transportation</b>	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	<b>High Speed Railways</b>	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	<b>Traffic Calming</b>	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.			
13DPB	<b>Diploma Thesis (for the Field BI)</b>	Z	5
13RZK	<b>Crisis Management</b>	KZ	3
Crisis situations and states of crisis. Risk of extraordinary events. Crisis management of state. Civil emergency planning. Economic mobilization. Social-psychological aspects of states of crisis. Legal aspects of activities during states of crisis. Subjects of economic mobilization. Emergency plan of economic mobilization subject.			
13XN1	<b>Master Project 1</b>	Z	2
13XN2	<b>Master Project 2</b>	Z	2
13XN3	<b>Master Project 3</b>	Z	1
13Y2DT	<b>Taxes and Fees in Transport and Telecommunications</b>	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, 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.			
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.			
14BSA	Software Safety - ADA	Z,ZK	6
Problems of safety and reliability of software, requirements to its safety and reliability in transportation applications, problems of portability and maintenance, ways of their reaching, relations to systems working in real time, safe SW design in EU standards, practical work with GNAT ADA system in excercises, formal design methods and CASE systems.			
14DPB	Diploma Thesis (for the Field BI)	Z	5
14MTSY	Telecommunications Systems Management	KZ	2
New trends in the area of e-communication services and relevant ecommunications networks, conditions and tools to provide optional set of services of required parameters based on hierarchal architecture of service management system (TMN). Positioning of broadband services, convergence trends leading to NGN. Financial criteria and tools as an integral part of providing service.			
14PEU	Electronic Communications Law in EU and CR	KZ	2
Basic overview of electronic communications (telecommunications, broadcasting, ICT). Legal construction. Relation of legal instruments available in the Czech Republic to the EU regulatory framework of electronic communications 2002.			
14SI	System Engineering	Z,ZK	4
Standard analysis methods and synthesis (projecting) of objects with system identification from the methodology standpoint.			
14TSYD	Telecommunications Services for Transport Applications	KZ	2
New trends in telecommunications applied in transport solutions, identification and quantification of telecommunications networks and services performance based on redundant architecture, provissioning of guaranteed service quality, two generations of the handover principles.			
14XN1	Master Project 1	Z	2
14XN2	Master Project 2	Z	2
14XN3	Master Project 3	Z	1
14Y2C1	CATIA I	KZ	2
Fundaments of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric stucture, 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
Classes, objects, encapsulation, inheritance, polymorphism, templates, retying, streams, events, repository, collections, virtual methods and classes. Examples will be derived from microscopic simulation systems, discrete event simulation, celulár simulations and virtual life simulations.			
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). Inforamtion systems implementation and operations description in the Czech Republic (technical and process) included lectures and visits.			
14Y2PJ	C++ Programming Language	KZ	2
Principles of object-oriented programming and C++ programming language. Basic concepts, such as - classes, objects, constructors, destructors, inheritance, virtual methods, exceptions, streams, overloading, ADT.			
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, provissioning of guaranteed service quality, two generations of the handover principles.			
14Y2UI	Artificial Intelligence	KZ	2
History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning.			
15DPB	Diploma Thesis (for the Field BI)	Z	5





15JBS3	Language - Spanish 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS4	Language - Spanish 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15SFY	Corporate Sociology	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.			
15XN1	Master Project 1	Z	2
15XN2	Master Project 2	Z	2
15XN3	Master Project 3	Z	1
15Y2DN	Transportation Psychology in German Speaking Countries	KZ	2
Introduction to larger view of the 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.).			
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 intercections, bridges and traffic control, development of road signs.			
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.			
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.			
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.			
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.			
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.			
15Y2SP	Seminar on Political Philosophy	KZ	2
Interpreting of philosophical texts, view of society, state and their system of government.			
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.			
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?			
16DPB	Diploma Thesis (for the Field BI)	Z	5
16XN1	Master Project 1	Z	2
16XN2	Master Project 2	Z	2
16XN3	Master Project 3	Z	1
16Y2HP	Vehicle Hygiene	KZ	2
Emissions and ergonomomy 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. Ergonomomy - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredom.			
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.			
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).			
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.			
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).			
17DPB	Diploma Thesis (for the Field BI)	Z	5
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	Z	2
17XN3	Master Project 3	Z	1

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.			
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.			
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.			
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.			
17Y2KI	Capital Investment in Transportation and Telecommunications	KZ	2
Financial market, investment decision making - long term goals and investment strategies, long term financing.			
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.			
17Y2P	Insurance Business	KZ	2
Insurance business - history and progress. Insurance company, insurance - sorts. Risks and damages. Reinsurance company, principle of reinsurance.			
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.).			
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.			
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.			
18DPB	Diploma Thesis (for the Field BI)	Z	5
18XN1	Master Project 1	Z	2
18XN2	Master Project 2	Z	2
18XN3	Master Project 3	Z	1
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 Basis of Materials' Properties	KZ	2
On the basis of internal structure and nature of intraction elastic material behavior and its maximum strength is explained. The model is further developed by considering different types of defects, loads and environment for explanation of failure mechanisms - the level of real strength determined by internal defects, and brittle fracture, fatigue and creep. Failures are discussed as a challenge posed to design of novel materials.			
18Y2SD	Reliability and Diagnostics, Experimental Methods	KZ	2
Reliability theory. Ultimate limit state and serviceability. Diagnosis of components and systems. Defects in materials and products. Experimental observation of the variables and mechanical phenomena. Model similarity. Non-destructive testing of materials and structures. Optical methods. Strain gauges. Experimental determination of residual stresses. Measurement errors. Evaluation experiments.			
18Y2UB	Accident Biomechanics and Safety	KZ	2
Anatomy of Man. Biomechanics of musculo-skeletal system. Medical diagnostic methods - X-ray, CT, MRI, US. Dynamics and causes of traumatic events. Pedestrian injuries. Injury accidents in road, rail and air traffic. Analysis of physical processes in terms of injury biomechanics. Principles of treatment and rehabilitation. Safety equipment and precautions to reduce the consequences of traffic accidens.			
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.			
20APS	Computer Systems Architecture	KZ	1
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.			

20DPB	Diploma Thesis (for the Field BI)	Z	5
20IDFS	Identification Systems Basic identification systems, its technologies (barcodes, RFID, biometrics), their features, usage, security and standards. Applications of identification systems, e. g. identification of vehicles, cargo, devices and processes. Identifier as foundation of traffic telematics standardization.	Z	2
20IPT	Information environment E - business and e - commerce environment creation, state and public information environment development in converging networks, data protection, telecommunications and information society.	ZK	2
20LNS	Localization and Navigation Systems Main principles of localization, satellite localization, performance parameters, processing of positioning data, digital cartographic data for navigation, navigation systems, dynamical navigation systems, applications of navigation systems.	KZ	2
20SIBS	Reliability Engineering and Safety of Systems Basic theory of reliability and safety with special regard to information and automation equipment used in transportation safety systems. Various aspects of reliability and safety systems analysis and synthesis. Problems of human subject - artificial systems.	ZK	3
20TSS	Telematic Systems and Services Telematic theory, telematic architecture, FRAME, cooperative systems - technologies, principles and applications, European electronic toll service, traffic information systems, e-call, automated vehicle systems, European railway traffic management system.	Z,ZK	3
20XN1	Master Project 1	Z	2
20XN2	Master Project 2	Z	2
20XN3	Master Project 3	Z	1
20Y2AP	Computer Systems Architecture 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.	KZ	2
20Y2MK	Quality Tools in the Development Phase 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.	KZ	2
20Y2NE	Design of Experiments in the Development Phase 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).	KZ	2
20Y2PR	Time Series Prediction Basic methods of quantitative forecasting, causal models, time series. Model performance evaluation, describing statistics, MAE, MAPE, RMSE, entropy measures, naive models. Basic theory of the linear prediction models, covariance and correlation coefficients, smoothing methods, regression methods, Box-Jenkins methodology, statistical tests, genetics algorithms.	KZ	2
20Y2TE	Technology of Electronic Systems Principle technologies for an effective operation of electronically controlled systems. Maintaining, measuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologies users and operators.	KZ	2
20Y2UA	Artificial Neural Networks, Realization and Applications History of neural networks. Basic principles. Comparing the structure of a natural and an artificial neuron. Neural classifiers, predictors, compressors, expanders and other specialised functional blocs and systems. Modelling of neurons. Grossberg's equations. Learning principles. Layered and Hopfield's nets.	KZ	2
21DPB	Diploma Thesis (for the Field BI)	Z	5
21XN1	Master Project 1	Z	2
21XN2	Master Project 2	Z	2
21XN3	Master Project 3	Z	1
21Y2LZ	Human Resources and Projects in Aviation 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.	KZ	2
21Y2MS	Aerospace Engineering Simulation and Modelling 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.	KZ	2
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 Parts of Aerodynamics Real gases physical properties, atmosphere. Fundamentals of fluid dynamics. External and internal aerodynamics in aircraft applications. Wing sections, wings, airfoil cascades, lift, drag. Polar, ideal incompressible and compressible flows. Viscous flows. Boundary layer, stability, turbulence. Reynolds, Strouhal and Mach Numbers. Flows aircraft aerodynamics and light dynamics. Static and dynamic stability. Anoeurability. Aircraft performances.	KZ	2
22DPB	Diploma Thesis (for the Field BI)	Z	5

22TZN	Technical Expertise	KZ	2
Historical evolution of sworn forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report. Appraisal and its role in the forensic.			
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22XN3	Master Project 3	Z	1
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.			
23BID	Security Engineering in Distributed Systems	ZK	4
Protocols, access management, cryptography role, distributed systems, multilevel security, multilateral security, banking and accounting systems, monitoring systems, control and command, security imprint and seals, biometry, physical security, emission security. Electronic information warfare. Net attacks and protection. Commercial system protection. Privacy protection. E - policy. Management instruments. System development and evaluation. Security standards.			
23BPR1	Security Training 1 Depending of semester plan.	KZ	4
23BPR2	Security Training 2 Depending of semester plan.	KZ	3
23DPB	Diploma Thesis (for the Field BI)	Z	5
23KY	Cybernality	ZK	3
Juridical aspects of behavior on the computer network and computer systems. Cybernetic crime technology. Theory basis and models. Cyberterrorism. Infore and connected aspects.			
23MAR	Risk Analysis and Management	Z,ZK	3
Concept of risks and terms. Risk sources, definition of hazard, impacts and risks. Methods for identification, analysis, assessment and management of risks. Risk engineering targets and good engineering practice. Methods, tools and techniques for risk engineering. System of systems risk. Application of strategic and system approach for benefit of security and development. Territorial, emergency and crisis planning. Human factor - its role.			
23OOM	Personal and property protection	ZK	2
Personal and property protection, technical and organization instruments. Definition of basic principles. Danger typology. Personal and property protection legislation. Institutional security management. OECD security management principles. Super-system security adapted to an institution. Secret and personal data protection. Protection systems and intrusion risks. Physical security technical instruments. External and internal detectors. Effective response and reconstruction principles. Human, technology and infrastructure survivability principles.			
23PDS	Advanced Database Systems	ZK	3
DBS principles, individual components functions, Conceptual, physical and database approaches to the data. Database models overview. Conceptual data model. Constructs. Integrity limits expression. Relation data model. Relation database schema. Database questioning languages. Decomposition quality criterions. Transactions. Errors correction. Parallel access coordination. Data protection. Physical data model. Index. Indexed cluster. Hash cluster.			
23PI	Transfer of Information	ZK	3
Theory of information - introduction. Theoretical and practical knowledge in the field of communication. Transfer ways summary. Encoding and decoding analog and numeric signals. Level architecture ISO and description of physical levels and its applications. Signal characteristics, encoding, cyclic codes, signal compressing. Analog signals modulation. Data transfer modulation. Transfer ways and networks, protocols level architecture.			
23PJC	Advanced Programming in C++	Z	2
Types, classes and objects, objects originating and ending, abstract data types, overloading. Genetics, virtual genetics, virtual methods. Dynamic allocation, indexes, conversion. Patterns, generic programming, compilation. Polymorphism, containers, iterators, algorithms. Exceptions, secure programming with exceptions. Secure and mobile programming, OS connections.			
23PJJ	Advanced programming in JAVA	KZ	2
Syntax, types, classes, interface, objects, genealogy, packets, operators. JAVA vs. C++ differences. Exceptions management: try, catch, throw orders. Field. Chains. Memory allocation. Garbage collection. Language interpreter. Environment run - time. Development instruments. Synchronization. Fibres. Basic distribution most used packets summary - group, collection, GUI, network support.			
23PSE	Computer network	ZK	3
Network functioning principles, internet. Internet protocols - UDP, IP, TCP, ARP, http [s], ftp,SMTP/TLS, Pop[s], imap[s], ssh /scp. Network services - directing, address translation [transfer], firewalls, proxy. Network vulnerability.			
23TP	Criminal Law in IT and Transportation	KZ	2
Introduction of criminal law into legal order, conception of culpability and criminal delict, consequence of other legal standards. international treaty and criminal law, investigation of crime, specific indicia of criminal court cases, practical examples.			
23VRZ	Human Resources Management and Development	ZK	3
Human resources management introduction. Company goals, strategy and culture. Human resources management, team management and internal communication. Human resources planning and development. Intercultural differences. Current legislation.			
23XN1	Master Project 1	Z	2
23XN2	Master Project 2	Z	2
23XN3	Master Project 3	Z	1
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.			
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.			
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.			

23Y2VZ	<b>Leadership and Human Resource Development</b>	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.			
23ZPM	<b>Intelligence Instruments and Methods</b>	KZ	2
History and present of intelligence services and there role in the modern world. Intelligence service information management. Methods and process of collection and evaluation of information. Intelligence service instruments. Internal and external intelligence. Military intelligence. State security services. Private security services and commercial intelligence. Intelligence service organization, efficiency and reliability.			

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