Study plan

Name of study plan: IS nav.prez.16/17 eština

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Technology in Transportation and Telecommunications Type of study: Follow-up master full-time Required credits: 120 Elective courses credits: 0 Sum of credits in the plan: 120 Note on the plan:

Name of the block: Semestrální projekt Minimal number of credits of the block: 16 The role of the block: ZP

Code of the group: XN IS 1.-4. 13/14 Name of the group: Projekt oboru IS 1.-4.sem. od 13/14 (pro N3710) Requirement credits in the group: In this group you have to gain 16 credits Requirement courses in the group: In this group you have to complete 4 courses Credits in the group: 16 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
11XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
11X13	Master Project 3	Z	4	0P+5C	Z	ZP
11XN4	Master Project 4	Z	8	0P+4C	L	ZP
12XN1	Master Project 1 Vladimír Pušman, Ond ej Nová ek	Z	2	0P+2C+4B	Z	ZP
12XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
12X13	Master Project 3	Z	4	0P+5C	Z	ZP
12XN4	Master Project 4	Z	8	0P+4C	L	ZP
14XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
14XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
14X13	Master Project 3	Z	4	0P+5C	Z	ZP
14XN4	Master Project 4	Z	8	0P+4C	L	ZP
15XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
15XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
15X13	Master Project 3	Z	4	0P+5C	Z	ZP
15XN4	Master Project 4	Z	8	0P+4C	L	ZP
16XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
16XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
16X13	Master Project 3	Z	4	0P+5C	Z	ZP
16XN4	Master Project 4	Z	8	0P+4C	L	ZP
17XN1	Master Project 1 Václav Baroch, Edvard B ezina, Michal Drábek, Alexandra Dvo á ková, Veronika Faifrová, Tomáš Horák, Vít Janoš, Milan K íž, Olga Mertlová,	Z	2	0P+2C+4B	Z	ZP
17XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
17X13	Master Project 3	Z	4	0P+5C	Z	ZP



17XN4	Master Project 4	Z	8	0P+4C	L	ZP
18XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
18XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
18X13	Master Project 3	Z	4	0P+5C	Z	ZP
18XN4	Master Project 4	Z	8	0P+4C	L	ZP
20XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
20XN2	Master Project 2 Vladimír Faltus	Z	2	0P+2C+8B	L	ZP
20X13	Master Project 3 Vladimír Faltus	Z	4	0P+5C	Z	ZP
20XN4	Master Project 4	Z	8	0P+4C	L	ZP
21XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
21XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
21X13	Master Project 3	Z	4	0P+5C	Z	ZP
21XN4	Master Project 4	Z	8	0P+4C	L	ZP
22XN1	Master Project 1 Tomáš Mi unek, Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zden k Svatý	Z	2	0P+2C+4B	Z	ZP
22XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
22X13	Master Project 3	Z	4	0P+5C	Z	ZP
22XN4	Master Project 4	Z	8	0P+4C	L	ZP
23XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
23XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
23X13	Master Project 3	Z	4	0P+5C	Z	ZP
23XN4	Master Project 4	Z	8	0P+4C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=XN IS 1.-4. 13/14 Name=Projekt oboru IS 1.-4.sem. od 13/14 (pro N3710)

110/10/			
11XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2
11X13	Master Project 3	Z	4
11XN4	Master Project 4	Z	8
12XN1	Master Project 1	Z	2
12XN2	Master Project 2	Z	2
12X13	Master Project 3	Z	4
12XN4	Master Project 4	Z	8
14XN1	Master Project 1	Z	2
14XN2	Master Project 2	Z	2
14X13	Master Project 3	Z	4
14XN4	Master Project 4	Z	8
15XN1	Master Project 1	Z	2
15XN2	Master Project 2	Z	2
15X13	Master Project 3	Z	4
15XN4	Master Project 4	Z	8
16XN1	Master Project 1	Z	2
16XN2	Master Project 2	Z	2
16X13	Master Project 3	Z	4
16XN4	Master Project 4	Z	8
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	Z	2
17X13	Master Project 3	Z	4
17XN4	Master Project 4	Z	8
18XN1	Master Project 1	Z	2
18XN2	Master Project 2	Z	2
18X13	Master Project 3	Z	4
18XN4	Master Project 4	Z	8
20XN1	Master Project 1	Z	2
20XN2	Master Project 2	Z	2
20X13	Master Project 3	Z	4
20XN4	Master Project 4	Z	8
21XN1	Master Project 1	Z	2
21XN2	Master Project 2	Z	2



21X13	Master Project 3	Z	4
21XN4	Master Project 4	Z	8
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22X13	Master Project 3	Z	4
22XN4	Master Project 4	Z	8
23XN1	Master Project 1	Z	2
23XN2	Master Project 2	Z	2
23X13	Master Project 3	Z	4
23XN4	Master Project 4	Z	8

Name of the block: Compulsory courses Minimal number of credits of the block: 104 The role of the block: Z

Code of the group: 1.S.NPIS 15/16 CZ Name of the group: 1.sem.nav.prez.IS -15/16 eština Requirement credits in the group: In this group you have to gain 28 credits Requirement courses in the group: In this group you have to complete 8 courses Credits in the group: 28 Note on the group:

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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
11MAI	ITS Mathematical Tools Jan P ikryl Jan P ikryl Jan P ikryl (Gar.)	Z,ZK	4	2P+2C	Z	Z
11TEF	Theoretical Physics at Transportation	Z,ZK	3	2P+1C	Z	Z
12TDP	Traffic Flow Theory Vladimír Faltus	Z,ZK	3	2P+1C	Z	Z
20SK	Signals and Codes	Z,ZK	4	2P+1C	Z	Z
20TRAS	Control and Reliability Theory in Transportation	ZK	4	4P+0C	Z	Z
20TSJ	Telematic systems and their design Martin Langr, Pavel Hrubeš	Z,ZK	6	3P+2C	Z	Z
14PBT	Advanced Wireless Technology	KZ	2	2P+0C	Z	Z
14PROM	Process Modeling	KZ	2	2P+0C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=1.S.NPIS 15/16 CZ Name=1.sem.nav.prez.IS -15/16 eština

11MAI	ITS Mathematical Tools	Z,ZK	4			
Series, Fourier Series. Discrete Fourier Transform. Segmentation of signals, windows, localization. Short-term Fourier Transform. From Fourier Analysis to PDE. Fundamentals of						
Numerical Mathematics. Numerical solutions to ODEs and PDEs. Continuous traffic flow models described by PDE. Car-following models as ODEs.						
11TEF	Theoretical Physics at Transportation	Z,ZK	3			
Generalized coordinates	s, Lagrange's equations of the first and the second kind, Hamilton's canonical equations, Canonical transformations, ergodic s	system, Weekly n	onintegrable			
Hamilton's systém, Cha	os, Potencial flow, Circumfluence of cylinder, conformal transformation, and method of singularity, Laminar flow, Turbulent flow	N.				
12TDP	Traffic Flow Theory	Z,ZK	3			
Mobility and associated	human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamentals	and applications	of mathematical			
models. Macroscopic, st	atistical and microscopic models. Theory of shock waves, queuing theory and special theory of traffic phenomena. Relation b	etween traffic mo	odels and traffic			
flow management.						
20SK	Signals and Codes	Z,ZK	4			
Time and frequency rep	resentation of signals. Discretization of signals, sampling, quantization and coding. Signal transmission, modulation and codii	ng. Coding theory	, information			
theory. Checksums and	selfcorrecting codes. Cryptography protocols. MATLAB excercises. Practical applications of coding and modulation.					
20TRAS	Control and Reliability Theory in Transportation	ZK	4			
Advanced methods of a	utomatic control. Methods of state space control, nonlinear control, adaptive control, fuzzy control and stochastic control. App	lication of these	methods on			
vehicular control and the	e control of traffic flows. Predicative diagnostics, safety in the traffic vehicles, safety infrastructure, human in the transportation a	ind traffic systems	and application			
of safety systems in trar	isportation.					
20TSJ	Telematic systems and their design	Z,ZK	6			
Gradual detailed analys	is of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management, \dot{i}	traffic manageme	nt, etc.			
14PBT	Advanced Wireless Technology	KZ	2			
Wireless networks tech	nology is applied in intelligent building management, in environmental monitoring, transportation, etc. Students will acquire kn	owledge regardir	ng the wireless			
transmission of data in v	rarious frequency bands, according to the communication standard IEEE 802.15.4 and Zigbee PRO protocol, Bluetooth, WiF	i, WirelessHART,	NFC, etc. The			
course will also include energy performance capture and network security.						
14PROM	Process Modeling	KZ	2			
Definition of the process, role, KPI's, areas of interest. Process Map, definition, purpose, clear examples and demonstrations, recommendations and standards, SIPOC. Process model,						
definition, purpose, procedures and tools, static and dynamic models. BPMN language, syntax and semantics, process flows. Implementation of practical examples, As-Is, To-Be,						
optimization and evalua	tion.					

Code of the group: 2.S.NPIS 13/14

Name of the group: 2.sem.nav.prez.IS 13/14

Requirement credits in the group: In this group you have to gain 28 credits

Requirement courses in the group: In this group you have to complete 11 courses

Credits in the group: 28

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)	Completion	Credits	Scope	Semester	Role
11RZ1	Pattern Recognition 1	Z,ZK	3	2P+1C	L	Z
11ZDA	Data Processing	Z,ZK	3	2P+1C	L	Z
14TITS	Telecommunications in ITS	Z,ZK	3	2P+1C	L	Z
14UES	Artificial Intelligence and Expert Systems in Transport	ZK	2	2P+0C	L	Z
20ARR	Risk Analysis and Management	Z,ZK	2	1P+1C	L	Z
23IV	Intelligent Vehicle and Safety	Z,ZK	2	1P+1C	L	Z
20EMI	Economy and Management of ITS Projects	KZ	3	2P+1C	L	Z
14DMS	Traffic Modelling and Simulation	Z	4	1P+3C	L	Z
16TAJ	Technological Aspects of Quality	Z	2	2P+0C	L	Z
20IDFS	Identification Systems	Z	2	2P+0C	L	Z
22APN	Analysis and Prevention of Traffic Accidents	Z	2	1P+1C	L	Z

Characteristics of the courses of this group of Study Plan: Code=2.S.NPIS 13/14 Name=2.sem.nav.prez.IS 13/14

11RZ1	Pattern Recognition 1	Z,ZK	3			
Elements of pattern rec	ognition. Basic PR concepts. Bayesian decision theory. Learning theory. Parametric classifiers. Context classifiers. Classificat	ion quality estima	tion. Vector			
support machines. Non-parametric classifiers. Feature selection. Cluster analysis.						
11ZDA	Data Processing	Z,ZK	3			
Specific problems of the	e field of processing of traffic data. Data preprocessing and analysis for use in additional applications.					
14TITS	Telecommunications in ITS	Z,ZK	3			
Specific legislative cond	litions for telecommunications solutions designed for ITS systems, quantification of telecommunications system parameters,	relation between	telematic (ITS)			
and telecommunications	s performance indicators, available tools for management of required telecommunications performance indicators limits namely	within the data IP	based networks,			
Typical data telecommu	nications solutions (backbone and access) applied within ITS.					
14UES	Artificial Intelligence and Expert Systems in Transport	ZK	2			
Introduction to artificial	intelligence, work in unified state space and with related techniques.					
20ARR	Risk Analysis and Management	Z,ZK	2			
The main focus of the c	ourse is to acquaint with the analysis, evaluation and control of risks in road transport, especially in relation to the tunnels. Th	ey are presented	probabilistic and			
deterministic methods f	or risk assessment, human behavior in crisis situations and factors that influence it. Students are more familiar with tunnel tee	chnology and rep	eats the basic			
concepts of the theory of	of traffic flow.					
23IV	Intelligent Vehicle and Safety	Z,ZK	2			
Content of the subject a	re basic terms, types of traffic injuries, restraint systems, injury biomechanics, active and passive safety.					
20EMI	Economy and Management of ITS Projects	KZ	3			
The course presents ba	sic theoretical knowledge for ITS effectiveness assesment in a lot of typical projects. The course covers methodology to obta	in economy and f	inancial models			
and their mutual synthe	sis to provide basis for feasibility studies for ITS implementation. It includes basic methods of project management with respe	ect to the organization	ational and			
legislative aspects of IT	S projects.					
14DMS	Traffic Modelling and Simulation	Z	4			
Introduction to the tools	for traffic simulation. Parameter modification and tuning, application in praxis.		-			
16TAJ	Technological Aspects of Quality	Z	2			
Certification and accred	itation, quality management, standards of quality management and its application, quality system creation, tools and methods of	of quality improve	ment, conformity			
assurance, environmental certification, workplace certification, QMS integration, classification, certification of products and producers.						
20IDFS	Identification Systems	Z	2			
Basic identification systems, its technologies (barcodes, RFID, biomerics), 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.						
22APN	Analysis and Prevention of Traffic Accidents	Z	2			
Basic definitions, types	of source materials, methods of analysis, influence of road, factors of accidents, vehicle faults etc.		•			

Code of the group: 3.S.NPIS 16/17 CZ Name of the group: 3.sem.nav.prez. IS 16/17 eština 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 7 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
11MMJ	Mathematical Models and their Applications Evženie Uglickich, Pavla Pecherková Evženie Uglickich Evženie Uglickich (Gar.)	Z,ZK	4	2P+2C+12B	Z	Z
20GIL	Geographical, Information, Localization and Navigation systems	Z,ZK	6	2P+2C	Z	Z
20SYN	System Engineering	Z,ZK	3	2P+1C	Z	Z
14PMD	Advanced Models for Transport	KZ	2	2P+0C	Z	Z
20HITS	ITS Effectiveness Assessment	KZ	2	2P+0C	Z	Z
12DZP	Transport and Environment	Z	2	2P+0C	Z	Z
16MRJ	Modelling of "Human - Machine" Interface	Z	3	2P+1C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=3.S.NPIS 16/17 CZ Name=3.sem.nav.prez. IS 16/17 eština

11MMJ	Mathematical Models and their Applications	Z,ZK	4		
System. Regression, dis	screte and logistic models. Bayesian estimation of model parameters. Parameter estimation of normal regression, discrete a	nd logistic models.	Classification		
with logistic model. One	-step and multi-step prediction with regression and discrete models. State model. State estimation. Kalman filter. Control with	n regression and o	discrete models.		
20GIL	Geographical, Information, Localization and Navigation systems	Z,ZK	6		
Introduction to GIS, mod	lel of real world, data structure for spatial data, methods if data input, digitalisation, geographics coordination systems, map r	projection, vector	data form, raster		
data form, spatial relatio	nships and algorithms, general GIS tasks, transportation domain, GIS applications. Main principles of localization, satellite loca	alization, performa	nce parameters,		
processing of positionin	g data, digital carthographic data for navigation, navigation systems, dynamical navigation systems, aplications of navigation	systems.			
20SYN	System Engineering	Z,ZK	3		
Enlarged definition of sy	stem in space of engineer tasks, specification of selected types of systems versus linked tools of system analysis and project	ction, acquitance	with selected		
instruments of identifica	tion of complicated systems, specifying of selected types of system engineering tasks. Examples of system enginnering's provide the system enginnering is provided by the system engineering tasks and the system engineering tasks.	actical methods a	nd tools.		
14PMD	Advanced Models for Transport	KZ	2		
Model category, descrip	tion of particular model types from discrete to continuous, explanation of applicability of the models to modeling of different k	kinds of transport.	There is not		
omitted user aspect and	there are explained typical bottlenecks of particular model use.				
20HITS	ITS Effectiveness Assessment	KZ	2		
The course presents the	e knowledge of strategical plans, feasibility studies of ITS systems implementation based on available information together w	ith the assessme	nt of different		
phases of ITS project.					
12DZP	Transport and Environment	Z	2		
This course aims the impact of transport on environment. The accent is put mainly on noise and vibration, emission, barrier effect and energy demands. The noise measury is part and					
parcel of this course.					
16MRJ	Modelling of "Human - Machine" Interface	Z	3		
Aspects of human -machine interaction. Summary of areas where HMI takes an important place in particular in transportation. Examples of vehicle simulators.					

Code of the group: 3.S.NPIS-V1-12/13

Name of the group: 3.sem.obor IS 1.výb r p edm t od 12/13 (pro N3710) 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
16VS	Vehicle Control Systems	Z,ZK	2	1P+1C	Z	Z
20PTA	Advanced Telematic Applications	Z,ZK	2	1P+1C	Z	Z
20ZZZ	Railway Interlocking Systems	Z,ZK	2	1P+1C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=3.S.NPIS-V1-12/13 Name=3.sem.obor IS 1.výb r p edm t od 12/13 (pro N3710)

16VS	Vehicle Control Systems	Z,ZK	2			
Basic features of regula	tory technology and theory of control. Elementary regulators (PID), dynamic properties of a vehicle and driver as a regulator.	Combustion engi	ne control, static			
engine optimization, cor	trol unit requirements. Electric driver and its components. DC devices, asynchronous engines, syncronous engines - principles,	construction, ele	mentary features			
and operation. Hybrid d	rive control to obtain the optimal efficiency. Car communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc). C	ontrol, safety, con	nmunication and			
comfort electronic syste	ms in a car. The practice is performed with real and simulated systems, car system communication, laboratory experiments a	and control on sel	ected electric			
devices.						
20PTA	Advanced Telematic Applications	Z,ZK	2			
The course presents ba	sic knowledge and description of ITS systems and services for public transport, e.g. for public transport companies, for users	s of public transpo	ort, for public			
transport integrators, et	c. and or freight transport, e.g. dangerous goods transport, transport of animals, etc.					
20ZZZ	Railway Interlocking Systems	Z,ZK	2			
This course reassume on the course "Railway interlocking plants". With basic knowledge about parts Railway interlocking plants, this course describes function and koncept railway						
interlocking systems. The main aim is observe on modern electronic systems and other systems with high level of railway control automation. Deal of this course will be focused on						
interoperability of control and command in railway.						

Code of the group: 3.S.NPIS-V2-12/13 Name of the group: 3.sem.obor IS 2.výb r p edm t od 12/13 (pro N3710) 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
14BKA	Safety Critical Applications in ITS	KZ	2	2P+0C	Z	Z
18STC	Special Materials and Technology Jaroslav Valach	KZ	2	2P+0C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=3.S.NPIS-V2-12/13 Name=3.sem.obor IS 2.výb r p edm t od 12/13 (pro N3710)

14BKA	Safety Critical Applications in ITS	KZ	2		
The need of system solution of HW and SW safety, partial specifics of safety, methods of safe systems development and safety proving. Introduction into legislative framework.					
18STC	Special Materials and Technology	KZ	2		
Basic Classification of Materials. Semiconductors. Ceramic materials. Polymers. Special kinds of Steels. Properties of Composite Materials.					

Code of the group: XNDPIS 13/14

Name of the group: Diplomová práce obor IS od 13/14 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 1 course 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
12XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
11XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
14XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
15XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
16XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
23XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
18XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
20XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
21XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
22XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z
17XIDP	Diploma Thesis (for the Field IS)	KZ	22	0P+24C	L	Z

Characteristics of the courses of this group of Study Plan: Code=XNDPIS 13/14 Name=Diplomová práce obor IS od 13/14

12XIDP	Diploma Thesis (for the Field IS)	KZ	22
11XIDP	Diploma Thesis (for the Field IS)	KZ	22
14XIDP	Diploma Thesis (for the Field IS)	KZ	22
15XIDP	Diploma Thesis (for the Field IS)	KZ	22
16XIDP	Diploma Thesis (for the Field IS)	KZ	22
23XIDP	Diploma Thesis (for the Field IS)	KZ	22
18XIDP	Diploma Thesis (for the Field IS)	KZ	22
20XIDP	Diploma Thesis (for the Field IS)	KZ	22
21XIDP	Diploma Thesis (for the Field IS)	KZ	22
22XIDP	Diploma Thesis (for the Field IS)	KZ	22
17XIDP	Diploma Thesis (for the Field IS)	KZ	22



List of courses of this pass:

11MAI ITS Mathematical Tools 2,2K 4 Numerical Microsite Docume Forumation Segmentations of gauss, witches, vacatablos, Storem Tourier Transform, Fourier Analysis to DEC, Analysis methods of analysis to the Analysis method. Characteristics and analysis methods and advect models. See model. Sale analysis and analysis methods to December and analysis methods. Characteristics and advect models. Characteristics. Baracteristics and advect models. Characteristics. Baracteristics and advect models. Characteristics. Baracteristics and the first physics at Transportation. Characteristics. Baracteristics and the first physics at Transportation. Characteristics. Baracteristics and the first physics at Transportation. Characteristics. Baracteristics. Baracteristics and the Baracteristics. Ba	Code	Name of the course	Completion	Credits		
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Numerical numerical control of your Cut Caroling of your Cut Properties 2015. 4 111MM_1 State State Control of your Cut Caroling of your Cut Control and State State Cut Control of your Cut Cont	Series, Fourier Series. Discrete Fourier Transform. Segmentation of signals, windows, localization. Short-term Fourier Transform. From Fourier Analysis to PDE. Fundamentals of					
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140E3A function intelligence, work in unified state space and with related techniques.2 K214X13Master Project 3Z414X1DPDiploma Thesis (for the Field IS)KZ2214XN1Master Project 1Z214XN2Master Project 2Z214XN4Master Project 4Z815X13Master Project 3Z415XN1Diploma Thesis (for the Field IS)KZ2215XN1Master Project 3Z215XN2Master Project 3Z415XN2Master Project 1Z215XN2Master Project 1Z215XN2Master Project 1Z215XN2Master Project 2Z2	141155	Artificial Intelligence and Expert Systems in Transport	71	2		
14X13Master Project 3Z414X1DPDiploma Thesis (for the Field IS)KZ2214XN1Master Project 1Z214XN2Master Project 2Z214XN4Master Project 4Z815X13Master Project 3Z415XIDPDiploma Thesis (for the Field IS)KZ2215XN1Master Project 3Z415XN2Master Project 1Z215XN2Master Project 1Z215XN2Master Project 2Z2	14023	Introduction to artificial intelligence, work in unified state space and with related techniques		2		
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14XN1Master Project 1Z214XN2Master Project 2Z214XN4Master Project 2Z815X13Master Project 3Z415XIDPDiploma Thesis (for the Field IS)KZ2215XN1Master Project 1Z215XN2Master Project 2Z2	14XIDP	Diploma Thesis (for the Field IS)	KZ	22		
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14XN4Master Project 4Z815X13Master Project 3Z415XIDPDiploma Thesis (for the Field IS)KZ2215XN1Master Project 1Z215XN2Master Project 2Z2	14XN2	Master Project 2	Z	2		
15X13Master Project 3Z415X1DPDiploma Thesis (for the Field IS)KZ2215XN1Master Project 1Z215XN2Master Project 2Z2	14XN4	Master Project 4	Z	8		
15XIDPDiploma Thesis (for the Field IS)KZ2215XN1Master Project 1Z215XN2Master Project 2Z2	15X13	Master Project 3	Z	4		
15XN1Master Project 1Z215XN2Master Project 2Z2	15XIDP	Diploma Thesis (for the Field IS)	KZ	22		
15XN2 Master Project 2 Z 2	15XN1	Master Project 1	Z	2		
	15XN2	Master Project 2	Z	2		



15XN4	Master Project 4	Z	8
16MR.I	Modelling of "Human - Machine" Interface	7	3
Accest	e of human marking interaction. Summary of a reasonable full takes as important place in particular in transportation. Summary of a reasonable of		0
Aspect		venicie simulators.	
16TAJ	Technological Aspects of Quality	Z	2
Certification and ac	creditation, quality management, standards of quality management and its application, quality system creation, tools and methods of q	uality improvement	, conformity
	assurance environmental certification workplace certification QMS integration classification certification of products and products	lucers	-
101/0		7 71/	0
1678	Venicle Control Systems	Z,ZK	2
Basic features of re	egulatory technology and theory of control. Elementary regulators (PID), dynamic properties of a vehicle and driver as a regulator. Co	mbustion engine c	ontrol, static
engine optimization	n, control unit requirements. Electric driver and its components. DC devices, asynchronous engines, syncronous engines - principles, con	nstruction, element	ary features
and operation Hyb	rid drive control to obtain the optimal efficiency. Car communication bus (CAN LIN FlexRay ISObus, KWP2000 protocole etc). Cont	rol safety commu	nication and
comfort oloctronic	exercises in a car. The practice is performed with real and simulated systems car system communication. Inhoratory experiments and	d control on coloct	od oloctric
Connortelectronic			eu electric
	devices.		
16X13	Master Project 3	Z	4
	Diploma Thesis (for the Field IS)	K7	22
TOXIDI			
16XN1	Master Project 1	Z	2
16XN2	Master Project 2	Z	2
	Master Priet 4		
16714	Master Project 4	Ζ	8
17X13	Master Project 3	Z	4
	Diploma Thesis (for the Field IS)	K 7	22
		NZ.	22
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	7	2
47\/\\4	Mastar Disisa 4		
17XN4	Master Project 4	۷	ŏ
18STC	Special Materials and Technology	KZ	2
	Basic Classification of Materials. Semiconductors. Ceramic materials. Polvmers. Special kinds of Steels. Properties of Composite N	Aaterials.	
401/40	Master Draited 2	7	4
18713	Master Project 3		4
18XIDP	Diploma Thesis (for the Field IS)	KZ	22
18XN1	Master Project 1	7	2
10/(11			
18XN2	Master Project 2	Z	2
18XN4	Master Project 4	Z	8
20400	Pick Analysis and Management	7.71	2
ZUARR		∠,∠r∖	~ ~
The main focus of t	the course is to acquaint with the analysis, evaluation and control of risks in road transport, especially in relation to the tunnels. They a	are presented prob	abilistic and
deterministic met	nods for risk assessment, human behavior in crisis situations and factors that influence it. Students are more familiar with tunnel tech	nology and repeat	s the basic
	concepts of the theory of traffic flow.		
20EMI	Economy and Management of ITS Projects	K7	3
	to basis theoretical knowledge for ITS offectiveness assembling in the transition projects the course expose methodology to obtain a		
The course presen	its basic ineurence knowledge for it's enertiveness assessment in a lot of typical projects. The course covers methodology to obtain the		
and their mutual	synthesis to provide basis for feasibility studies for 115 implementation. It includes basic methods of project management with respe	ct to the organizat	onal and
	legislative aspects of ITS projects.		
20GIL	Geographical. Information, Localization and Navigation systems	Z,ZK	6
Introduction to GIS	model of real world, data structure for spatial data, methods if data input, digitalisation, geographics coordination systems, map proj	ection. vector data	form. raster
data form spatial re	alationshins and algorithms, general GIS tasks, transportation domain, GIS applications, Main principles of localization, satellite localization	tion performance	arameters
proces	participante anglinamine, general de la conteneración ante presidente a populational man principae de localizad		barameters,
pioces			
20HITS	IIS Effectiveness Assessment	KZ	2
The course prese	ents the knowledge of strategical plans, feasibility studies of ITS systems implementation based on available information together with	n the assessment of	of different
	phases of ITS project.		
201059	Idantification Systems	7	2
ZUIDI O	e entere la technologie (herede DED bereise) de la factoria enteretadade Archedent et destructures de la constance de la	∠	<u>ک</u>
Basic identificatio	in systems, its technologies (barcodes, RFID, biomencs), their realities, usage, security and standards. Applications of identification s	systems, e. g. ident	incation of
	vehicles, cargo, devices and processes. Identifier as foundation of traffic telematics standardization.	-	
20PTA	Advanced Telematic Applications	Z,ZK	2
The course prese	ents basic knowledge and description of ITS systems and services for public transport. e.g. for public transport companies for users	of public transport	for public
	transport integrators atc and or frainht transport a d dandarous goods transport dransport of animals de	1	1
	transport integrators, etc. and or negrit transport, e.g. dangerous goods transport, transport or animals, etc.		
20SK	Signals and Codes	Z,ZK	4
Time and frequer	ncy representation of signals. Discretization of signals, sampling, quantization and coding. Signal transmission, modulation and coding	g. Coding theory, ir	nformation
	theory. Checksums and selfcorrecting codes. Cryptography protocols. MATLAB excercises. Practical applications of coding and mo	dulation.	
20571	System Engineering	7 7K	3
20311	Gystern Engineening	∠,∠r∖	3
Enlarged definition	in of system in space of engineer tasks, specification of selected types of systems versus linked tools of system analysis and projecti	on, acquitance wit	n selected
instruments of	identification of complicated systems, specifying of selected types of system engineering tasks. Examples of system enginnering's pr	actical methods ar	nd tools.
20TRAS	Control and Reliability Theory in Transportation	ZK	4
Advanced metho	ds of automatic control. Methods of state space control nonlinear control, adaptive control fuzzy control and stochastic control. And	lication of these m	thods on
vobicular control	at the control of traffic flows. Bradingting diagnostics, control, no information of the control, nazy control and stociastic control. Application of the control of traffic vehicles and the control of traffic vehicles and the control of the contr	traffic evotores are	
		and systems and	application
	of safety systems in transportation.		
20TSJ	Telematic systems and their design	7 7K	6
Gradual detail			0
	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management	, traffic manademe	ent, etc.
201/12	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management	, traffic manageme	ent, etc.
20X13	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management Master Project 3	, traffic manageme	ent, etc. 4
20X13 20XIDP	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management Master Project 3 Diploma Thesis (for the Field IS)	z, traffic manageme Z KZ	ent, etc. 4 22
20X13 20XIDP 20XN1	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management Master Project 3 Diploma Thesis (for the Field IS) Master Project 1	z, traffic manageme Z KZ 7	ent, etc. 4 22 2
20X13 20XIDP 20XN1	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management Master Project 3 Diploma Thesis (for the Field IS) Master Project 1 Master Design 4.2	, traffic manageme Z KZ Z	ent, etc. 4 22 2
20X13 20XIDP 20XN1 20XN2	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management Master Project 3 Diploma Thesis (for the Field IS) Master Project 1 Master Project 2	, traffic manageme Z KZ Z Z	ent, etc. 4 22 2 2
20X13 20XIDP 20XN1 20XN2 20XN2	ed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management Master Project 3 Diploma Thesis (for the Field IS) Master Project 1 Master Project 2 Master Project 4	, traffic manageme Z KZ Z Z Z	ent, etc. 4 22 2 2 8

20ZZZ	Railway Interlocking Systems	Z,ZK	2
This course reass	ume on the course "Railway interlocking plants". With basic knowledge about parts Railway interlocking plants, this course described about parts Railway interlocking plants, the course described about plants about plants, the course described about plants	ribes function and kond	cept railway
interlocking syste	ms. The main aim is observe on modern electronic systems and other systems with high level of railway control automation. Dea	I of this course will be	focused on
	interoperability of control and command in railway.		
21X13	Master Project 3	Z	4
21XIDP	Diploma Thesis (for the Field IS)	KZ	22
21XN1	Master Project 1	Z	2
21XN2	Master Project 2	Z	2
21XN4	Master Project 4	Z	8
22APN	Analysis and Prevention of Traffic Accidents	Z	2
	. Basic definitions, types of source materials, methods of analysis, influence of road, factors of accidents, vehicle faults	s etc.	
22X13	Master Project 3	Z	4
22XIDP	Diploma Thesis (for the Field IS)	KZ	22
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22XN4	Master Project 4	Z	8
23IV	Intelligent Vehicle and Safety	Z,ZK	2
	Content of the subject are basic terms, types of traffic injuries, restraint systems, injury biomechanics, active and passive	e safety.	
23X13	Master Project 3	Z	4
23XIDP	Diploma Thesis (for the Field IS)	KZ	22
23XN1	Master Project 1	Z	2
23XN2	Master Project 2	Z	2
23XN4	Master Project 4	Z	8

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