### Study plan

### Name of study plan: Master Full-Time IS (joint degree) from 2024/25

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Intelligent Transport Systems 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: Compulsory courses Minimal number of credits of the block: 93 The role of the block: Z

Code of the group: 1S-NP-IS-EN-21/22 Name of the group: 1st Sem. Master Full-Time IS (EN) from 2021/22 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 5 courses Credits in the group: 22 Note on the group:

	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
11MAI-E	ITS Mathematical Tools Jan P ikryl Jan P ikryl Jan P ikryl (Gar.)	Z,ZK	4	2P+2C	Z	Z
16DITS-E	Vehicles within ITS Jan Leistner, Filip Kotas, David Lehet, Jaroslav Machan	Z,ZK	4	2P+2C	Z	Z
20GINS-E	Geographical, information, localization and navigation systems Petr Bureš, František Kekula, Pavel Hrubeš, Zuzana Purkrábková <b>Pavel</b> Hrubeš	Z,ZK	6	3P+3C	Z	Z
20TSJ-E	Telematic systems and their design Petr Bureš, Ond ej P ibyl Petr Bureš	Z,ZK	6	3P+2C	Z	Z

# Characteristics of the courses of this group of Study Plan: Code=1S-NP-IS-EN-21/22 Name=1st Sem. Master Full-Time IS (EN) from 2021/22

11MAI-E       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.       Numerical Solutions to ODEs and PDEs. Continuous traffic flow models described by PDE. Car-following models as ODEs.         16DITS-E       Vehicles within ITS       Z,ZK       4         Design of the vehicle with focus on its use and function in frame of ITS. User requirement analyses. Economic aspects. Process of constructions in a concept phase, functional dependences and structure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy transformations leading to kinetic one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.       Z,ZK       6         20GINS-E       Geographical, information, localization and navigation systems with special attention to the specialization in the field of transport and telecommunication. It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitzation methods, and a number of each other the special attention to the specialization methods, and a number of each other the special attention attention and navigation systems other								
Numerical Mathematics. Numerical solutions to ODEs and PDEs. Continuous traffic flow models described by PDE. Car-following models as ODEs.         16DITS-E       Vehicles within ITS       Z,ZK       4         Design of the vehicle with focus on its use and function in frame of ITS. User requirement analyses. Economic aspects. Process of constructions in a concept phase, functional dependences and structure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy transformations leading to kinetic one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.         20GINS-E       Geographical, information, localization and navigation systems with special attention to the specialization in the field of transport and telecommunication. It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	11MAI-E	ITS Mathematical Tools	Z,ZK	4				
16DITS-E       Vehicles within ITS       Z,ZK       4         Design of the vehicle with focus on its use and function in frame of ITS. User requirement analyses. Economic aspects. Process of constructions in a concept phase, functional dependences and structure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy transformations leading to kinetic one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.       20GINS-E       Geographical, information, localization and navigation systems       Z,ZK       6         The subject is specialized in problems of work with applications of geographic information systems with special attention to the specialization in the field of transport and telecommunication. It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	Series, Fourier Series. Discrete Fourier Transform. Segmentation of signals, windows, localization. Short-term Fourier Transform. From Fourier Analysis to PDE. Fundamentals of							
Design of the vehicle with focus on its use and function in frame of ITS. User requirement analyses. Economic aspects. Process of constructions in a concept phase, functional dependences and structure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy transformations leading to kinetic one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.         20GINS-E       Geographical, information, localization and navigation systems with special attention to the specialization in the field of transport and telecommunication. It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	Numerical Mathematics.	Numerical solutions to ODEs and PDEs. Continuous traffic flow models described by PDE. Car-following models as ODEs.						
dependences and structure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy transformations leading to kinetic one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.         20GINS-E       Geographical, information, localization and navigation systems       Z,ZK       6         The subject is specialized in problems of work with applications of geographic information systems with special attention to the specialization in the field of transport and telecommunication. It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	16DITS-E	Vehicles within ITS	Z,ZK	4				
one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.         20GINS-E       Geographical, information, localization and navigation systems         The subject is specialized in problems of work with applications of geographic information systems with special attention to the specialization in the field of transport and telecommunication.         It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	Design of the vehicle wit	h focus on its use and function in frame of ITS. User requirement analyses. Economic aspects. Process of constructions in a	a concept phase, f	unctional				
20GINS-E       Geographical, information, localization and navigation systems       Z,ZK       6         The subject is specialized in problems of work with applications of geographic information systems with special attention to the specialization in the field of transport and telecommunication.       It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	dependences and struct	ure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy tra	insformations lead	ling to kinetic				
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It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number	20GINS-E	Geographical, information, localization and navigation systems	Z,ZK	6				
	The subject is specialized	d in problems of work with applications of geographic information systems with special attention to the specialization in the field c	of transport and tele	ecommunication.				
of other CIC related to share to such as machine many inclusion at	It introduces students to geographic data management practices and tools, real world modeling, geographic data storage models, data entry and digitization methods, and a number							
of other GIS related technologies such as problem mapping, webmap, etc.								
20TSJ-E Telematic systems and their design Z,ZK 6	20TSJ-E	Telematic systems and their design	Z,ZK	6				
Gradual detailed analysis of individual existing telematics systems in modes of transport, such as toll systems, vehicle weighing, fleet management, traffic management, etc.								

Code of the group: 1S-NP-IS-EN-V-21/22

Name of the group: 1st Sem. Master Full-Time IS (EN) Alternative from 2021/22 Requirement credits in the group: In this group you have to gain 3 credits Requirement courses in the group: In this group you have to complete 1 course Credits in the group: 3 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
12TDP-E	Traffic Flow Theory Vladimír Faltus	Z,ZK	3	2P+1C	Z	Z
16ESDP-E	Electronic systems in modern vehicles Dmitrij Rožd stvenský, Petr Bouchner	Z,ZK	3	2P+1C	Z	Z
20MZZ-E	Modern techniques of safety control of moving railway vehicles Martin Leso Martin Leso	Z,ZK	3	2P+1C	z	Z

# Characteristics of the courses of this group of Study Plan: Code=1S-NP-IS-EN-V-21/22 Name=1st Sem. Master Full-Time IS (EN) Alternative from 2021/22

12TDP-E	Traffic Flow Theory	Z,ZK	3
Mobility and associa	ted human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamental	s and applications	of mathematica
models. Macroscopi	c, statistical and microscopic models. Theory of shock waves, queuing theory and special theory of traffic phenomena. Relation	between traffic me	odels and traffic
flow management.			
16ESDP-E	Electronic systems in modern vehicles	Z,ZK	3
Advanced vehicle s	stems, electromobility, V2I and V2V, autonomous driving. Combustion engine control and electronic control units. Electric propu	sion, its compone	ents, basic
characteristics and	control. Management of hybrid propulsion for attaining its optimal efficiency. Vehicle communication bus (CAN, LIN, FlexRay etc.	). Safety, commun	ication and
comfort electronic v	chicle systems. Practical exercises with real and simulated systems.		
20MZZ-E	Modern techniques of safety control of moving railway vehicles	Z,ZK	3
ERTMS / ETCS con	cepts, ETCS architecture and interface descriptions, ERTMS system level, infrastructure and mobile part of the system, linking	to stationary secu	rity systems,
operating and applic	ation modes of the system, infrastructure orientation, interface (DMI), integration of the ETCS mobile part into the driving vehicl	e, GSM-R functio	nal specificatio
testing and legislation	n.		

#### Code of the group: 2S-NP-IS-EN-21/22

### Name of the group: 2nd Sem. Master Full-Time IS (EN) from 2021/22

### 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 5 courses

#### Credits in the group: 21

#### Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
14CITS-E	<b>C-ITS Systems</b> Zden k Lokaj, Tomáš Zelinka, Miroslav Vaniš <b>Zden k Lokaj</b> Zden k Lokaj (Gar.)	Z,ZK	6	3P+3C	L	Z
14PAM-E	<b>Programming and modelling</b> Vít Fábera, Tomáš Brandejský, Marek Kalika, Martin Fiala <b>Vít Fábera</b> Vít Fábera (Gar.)	Z,ZK	4	2P+2C	L	Z
14PD-E	Data processing Miroslav Vaniš, Martin Šrotý <b>Michal Je ábek</b> Michal Je ábek (Gar.)	Z,ZK	6	2P+4C	L	Z
14PPRP-E	Computer Aided Project Management Marek Kalika Marek Kalika Marek Kalika (Gar.)	KZ	2	0P+2C	L	Z
20BITS-E	Safety and reliability of ITS Systems Vladimír Faltus, Tomáš Tichý Tomáš Tichý (Gar.)	KZ	3	2P+1C	L	Z

## Characteristics of the courses of this group of Study Plan: Code=2S-NP-IS-EN-21/22 Name=2nd Sem. Master Full-Time IS (EN) from 2021/22

14CITS-E C-ITS Systems	Z,ZK	6					
Detailed description of C-ITS systems architecture, description of use-cases - urban and rural applications, principles of C-ITS functionality with focus	s on data exchanç	e (CAM, DENM,					
IVI) and C-ITS security architecture. Status quo and modern trends of wireless telecommunication solutions ITS-G5 and LTE-V and description of its properties and specifics. Course							
will also cover signal processing.							
14PAM-E Programming and modelling	Z,ZK	4					
Object oriented programming, dynamic memory allocation, inheritage, generic programming, STL, abstract data types, programming techniques, red	cursion, complexit	y, Lindenmeyer's					
grammars, paralism in nature and in real systems, paralel computer systems, paralel programming, discrete simulation, models of processes, mode	I types As-Is a To	-Be, acquisition					
of analytical sources for modelling, BPMN language, SW Bizagi, model creation and life cycle.							
14PD-E Data processing	Z,ZK	6					
Students will learn about tools for data processing and analysis, using practical examples to try out the most common options used in data processi	ng, including adva	anced options for					
presenting the results of analyses. In advanced methods, students will also perform specific analysis using Bayesian networks. Students will then inc	dependently perfo	rm data analysis					
on data from existing open systems.							
14PPRP-E Computer Aided Project Management	KZ	2					
What is the project? The basic terms a concepts of project management. Life cycle of the project and its phased approach. Analysis and specification	on of the assignme	ent, activity					
definition, stages, objectives and measurability. Risk events and risk planning. Project change management during implementation. Preparation of the project outline (activities,							
restrictions, assignments, calendars etc.) Project planning and optimization - time, resources.							
20BITS-E Safety and reliability of ITS Systems	KZ	3					
The basic concepts of safety and reliability in the job and application. Basic schema and types of diagnostic systems including reliability diagnostics of technical equipment and ITS.							
Investigation of acceptability and reliability prediction, traffic crity and sensitivity analysis. Neural Networks and other optimization algorithms and ETA, FMEA failure analysis. HMI in							
traffic including operator testing on simulator and in real-world situatiation							

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
14MIM-E	Microsimulation Models Jan Mejst ík Jan Mejst ík Jan Mejst ík (Gar.)	KZ	3	0P+3C	L	Z
16SHMI-E	Simulation and HMI Petr Bouchner, Stanislav Novotný, Tereza Kunclová, Michal Cenkner Stanislav Novotný (Gar.)	Z,ZK	3	2P+1C	L	Z
20ITSR-E	ITS - R Martin Leso Martin Leso (Gar.)	Z,ZK	3	2P+1C	L	Z

# Characteristics of the courses of this group of Study Plan: Code=2S-NP-IS-EN-V-21/22 Name=2nd Sem. Master Full-Time IS (EN) Alternative from 2021/22

14MIM-E	Microsimulation Models	KZ	3
Basic knowledge of traf	fic modeling and simulation will be broaded by the application of traffic control algorithms to traffic microsimulation models us	sed in ITS. These	include, for
example, the proposal o	f algorithms for actuated signal control, pedestrian preference, dynamic network routing, road line traffic control, crossing secu	rity equipment, an	d PT preference.
Algorithms will be desig	ned, applied, and tested by students themselves.		
16SHMI-E	Simulation and HMI	Z,ZK	3
Simulation for the syste	, ms in transportation and vehicle systems. User interface, HMI (human-machine interaction), virtual reality and computer grap	hics for ITS. Simul	ation theory with
application of computing	g equipment. Creating computing models. Mechanic and dynamic systems and their mathematical models. Simulation of veh	icle dynamics, on	-land carriage in
particular. Virtual reality	systems.		
20ITSR-E	ITS - R	Z,ZK	3
The introduction is devo	ted to description of the architecture and interface of the system with the ITS-R concept, the communication interface of the	system, principle	s of ensuring
functional and security f	eatures are defined. The principles of ERTMS / ETCS application level 3, UGTMS, CBTC are discussed in detail. Current and f	uture communica	tion technologies
are described.			

#### Code of the group: 3S-NP-IS-EN-21/22

Name of the group: 3rd Sem. Master Full-Time IS (EN) from 2021/22 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 4 courses Credits in the group: 21 Note on the group:

#### Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) Mathematical Methods for Data Analysis 6 3P+3C Ζ 11MMAD-E Z,ZK Ζ Magdalena Hykšová, Ivan Nagy Magdalena Hykšová Magdalena Hykšová (Gar.) Application of ITS in Urban Engineering 20AIMI-E Ζ Z,ZK 6 3P+3C Tomáš Tichý, Dagmar Ko árková, Josef Kocourek, Josef Filip, Ji í R ži ka z Tomáš Tichý System Engineering 20SYIN-E Z.ZK Ζ 6 4P+2C z Zuzana B linová Zuzana B linová **Evaluation and Economics of ITS** 20HEI-E ΚZ 3 2P+1C Ζ Ζ Jakub Rajnoch Jakub Rajnoch

### Characteristics of the courses of this group of Study Plan: Code=3S-NP-IS-EN-21/22 Name=3rd Sem. Master Full-Time IS (EN) from 2021/22

11MMAD-E	Mathematical Methods for Data Analysis	Z,ZK	6					
Stocastic modelling, estimation, prediction, filtration, control, methods of data analysis: k-means, DBSCAN, naive Bayes, decision trees, support vector machine.								
20AIMI-E	Application of ITS in Urban Engineering	Z,ZK	6					
The course focuses mai	, nly on the issue of the installation of engineering networks in the area, coordination of engineering activities in the area, organi	zation of the publi	c space, concept					
of public space solution	s, design of systems for traffic and transport telematics management, coordination of transport modes - automobil, pedestria	n, MHD, cyclo, m	odes etc. New					
approaches to the deve	lopment of Smart and green approaches Promoting into Public.							
20SYIN-E	System Engineering	Z,ZK	6					
Enhanced system definition in engineering tasks, specification of selected system types against related tools of system analysis and design, refinement of selected types of system								
engineering tasks, definition of system strategy, connection to science-based methodological basics of transport, strategic thinking processes, strategic management system, context								
of sustainable developm	of sustainable development.							

20HEI-E	Evaluation and Economics of ITS	KZ	3		
Introduction of subject is devoted to the basics of system approach to development of ITS architecture and fundamentals in the field of economic attributes connected with development					
of ITS. Subsequently, th	e basic principles of system and application creation in the technical field are discussed, defining the penetration of the technical field are discussed.	nical solution into	the economy.		
<b>T</b> I I I I I I I I I I I I I I I I I I I					

The subject is terminated by a detailed breakdown of case studies.

#### Code of the group: 3S-NP-IS-EN-V-21/22 Name of the group: 3rd Sem. Master Full-Time IS (EN) Alternative from 2021/22 Requirement credits in the group: In this group you have to gain 3 credits Requirement courses in the group: In this group you have to complete 1 course Credits in the group: 3

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
16KSD-E	Quality and reliability in area of transportation means and systems Jan Leistner, Filip Kotas, David Lehet, Jaroslav Machan	Z,ZK	3	2P+1C	Z	Z
20PRZP-E	Computer aided railway traffic control Dušan Kamenický Dušan Kamenický	Z,ZK	3	2P+1C	Z	Z
20TVHD-E	Telematics in Public Transport Patrik Horaž ovský, Milan Sliacky Milan Sliacky	Z,ZK	3	2P+1C	Z	Z

# Characteristics of the courses of this group of Study Plan: Code=3S-NP-IS-EN-V-21/22 Name=3rd Sem. Master Full-Time IS (EN) Alternative from 2021/22

Z,ZK	3						
Quality methods used for design, manufacturing and operation. Methods QFD, DFM, DFA, DFS. Longtime testing. FMEA method. Operation reliability. Methods for process optimizing,							
process design and quality improvement (Six Sigma etc.). Certification and accreditation, quality management, tools and methods for quality stabilization and improvement. Students							
Z,ZK	3						
of railway traffic m	anagement,						
nts of the system	which must be						
included in the systems for automation of railway traffic control using computer technologies.							
Z,ZK	3						
Ticketing and information systems; foreinght experiences; vehicle technology; dispatching systems; Information Systems; data structures; clearing; Public Transport preferences; vehicle							
position monitoring; legislative framework; standardization, certification and interoperability.							
a n	Methods for pro- tion and improve Z,ZK f railway traffic m ts of the system, Z,ZK						

### Code of the group: XD-NP-IS-EN-21/22

Name of the group: Thesis Master Full-Time IS (EN) from 2021/22

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 1 course

#### 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
11XNDS-E	Master Thesis for study programme IS Jan P ikryl, Bohumil Ková Jan P ikryl Bohumil Ková (Gar.)	Z	16	0P+16C	L	Z
12XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z
14XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z
15XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z
16XNDS-E	Master Thesis for study programme IS Stanislav Novotný	Z	16	0P+16C	L	Z
17XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z
18XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z
20XNDS-E	Master Thesis for study programme IS Martin Leso	Z	16	0P+16C	L	Z
21XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z
22XNDS-E	Master Thesis for study programme IS	Z	16	0P+16C	L	Z

### Characteristics of the courses of this group of Study Plan: Code=XD-NP-IS-EN-21/22 Name=Thesis Master Full-Time IS (EN) from 2021/22

11XNDS-E	Master Thesis for study programme IS	Z	16
12XNDS-E	Master Thesis for study programme IS	Z	16
14XNDS-E	Master Thesis for study programme IS	Z	16

15XNDS-E	Master Thesis for study programme IS	Z	16
16XNDS-E	Master Thesis for study programme IS	Z	16
17XNDS-E	Master Thesis for study programme IS	Z	16
18XNDS-E	Master Thesis for study programme IS	Z	16
20XNDS-E	Master Thesis for study programme IS	Z	16
21XNDS-E	Master Thesis for study programme IS	Z	16
22XNDS-E	Master Thesis for study programme IS	Z	16

Code of the group: XP-NP-IS-EN-21/22 Name of the group: Praxis Master Full-Time IS (EN) from 2021/22 Requirement credits in the group: In this group you have to gain 4 credits Requirement courses in the group: In this group you have to complete 1 course Credits in the group: 4 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11XPXS-E	Training course for study programme IS Jan P ikryl, Bohumil Ková, Evženie Uglickich Jan P ikryl Bohumil Ková (Gar.)	Z	4	0P+4C	L	Z
12XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z
14XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z
15XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z
16XPXS-E	Training course for study programme IS Josef Mik	Z	4	0P+4C	L	Z
17XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z
18XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z
20XPXS-E	Training course for study programme IS Ji í R ži ka	Z	4	0P+4C	L	Z
21XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z
22XPXS-E	Training course for study programme IS	Z	4	0P+4C	L	Z

Characteristics of the courses of this group of Study Plan: Code=XP-NP-IS-EN-21/22 Name=Praxis Master Full-Time IS (EN) from 2021/22					
11XPXS-E	Training course for study programme IS	Z	4		
12XPXS-E	Training course for study programme IS	Z	4		
14XPXS-E	Training course for study programme IS	Z	4		
15XPXS-E	Training course for study programme IS	Z	4		
16XPXS-E	Training course for study programme IS	Z	4		
17XPXS-E	Training course for study programme IS	Z	4		
18XPXS-E	Training course for study programme IS	Z	4		
20XPXS-E	Training course for study programme IS	Z	4		
21XPXS-E	Training course for study programme IS	Z	4		
22XPXS-E	Training course for study programme IS	Z	4		

Name of the block: Semestrální projekt Minimal number of credits of the block: 27 The role of the block: ZP

Code of the group: X2-NP-IS-EN-21/22 Name of the group: Research Groups Master Full-Time IS (EN) from 2021/22 Requirement credits in the group: In this group you have to gain 27 credits Requirement courses in the group: In this group you have to complete 4 courses Credits in the group: 27 Note on the group:

Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) Master project 1 for study programme IS 11XN1S-E Ζ 0P+4C Ζ 5 Jan P ikryl, Bohumil Ková, Evženie Uglickich Jan P ikryl Evženie Uglickich 7P (Gar.)

12XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
14XN1S-E	Master project 1 for study programme IS Martin Šrotý Martin Šrotý (Gar.)	Z	5	0P+4C	Z	ZP
15XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
16XN1S-E	Master project 1 for study programme IS Jan Leistner, David Lehet, Tereza Kunclová	Z	5	0P+4C	Z	ZP
17XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
18XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
20XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
21XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
22XN1S-E	Master project 1 for study programme IS	Z	5	0P+4C	Z	ZP
11XN2S-E	Master project 2 for study programme IS Jan P ikryl, Bohumil Ková, Evženie Uglickich Jan P ikryl Jan P ikryl (Gar.)	Z	6	0P+4C	L	ZP
12XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
14XN2S-E	Master project 2 for study programme IS Zden k Lokaj, Tomáš Zelinka, Martin Srotý	Z	6	0P+4C	L	ZP
15XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
16XN2S-E	Master project 2 for study programme IS Jan Leistner, David Lehet, Tereza Kunclová	Z	6	0P+4C	L	ZP
17XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
18XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
20XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
21XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
22XN2S-E	Master project 2 for study programme IS	Z	6	0P+4C	L	ZP
11XN3S-E	Master project 3 for study programme IS Jan P ikryl Jan P ikryl Jan P ikryl (Gar.)	Z	6	0P+4C	Z	ZP
12XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
14XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
15XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
16XN3S-E	Master project 3 for study programme IS Petr Bouchner, Na a Tylová	Z	6	0P+4C	Z	ZP
17XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
18XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
20XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
21XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
22XN3S-E	Master project 3 for study programme IS	Z	6	0P+4C	Z	ZP
11XN4S-E	Master project 4 for study programme IS Jan P ikryl, Bohumil Ková Jan P ikryl Bohumil Ková (Gar.)	Z	10	0P+8C	L	ZP
12XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP
14XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP
15XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP
16XN4S-E	Master project 4 for study programme IS Stanislav Novotný	Z	10	0P+8C	L	ZP
17XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP
18XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP
20XN4S-E	Master project 4 for study programme IS Martin Leso	Z	10	0P+8C	L	ZP
21XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP
22XN4S-E	Master project 4 for study programme IS	Z	10	0P+8C	L	ZP

# Characteristics of the courses of this group of Study Plan: Code=X2-NP-IS-EN-21/22 Name=Research Groups Master Full-Time IS (EN) from 2021/22

11XN1S-E	Master project 1 for study programme IS	Z	5
12XN1S-E	Master project 1 for study programme IS	Z	5
14XN1S-E	Master project 1 for study programme IS	Z	5
15XN1S-E	Master project 1 for study programme IS	Z	5
16XN1S-E	Master project 1 for study programme IS	Z	5
17XN1S-E	Master project 1 for study programme IS	Z	5
18XN1S-E	Master project 1 for study programme IS	Z	5
20XN1S-E	Master project 1 for study programme IS	Z	5
21XN1S-E	Master project 1 for study programme IS	Z	5

22XN1S-E	Master project 1 for study programme IS	Z	5
11XN2S-E	Master project 2 for study programme IS	Z	6
12XN2S-E	Master project 2 for study programme IS	Z	6
14XN2S-E	Master project 2 for study programme IS	Z	6
15XN2S-E	Master project 2 for study programme IS	Z	6
16XN2S-E	Master project 2 for study programme IS	Z	6
17XN2S-E	Master project 2 for study programme IS	Z	6
18XN2S-E	Master project 2 for study programme IS	Z	6
20XN2S-E	Master project 2 for study programme IS	Z	6
21XN2S-E	Master project 2 for study programme IS	Z	6
22XN2S-E	Master project 2 for study programme IS	Z	6
11XN3S-E	Master project 3 for study programme IS	Z	6
12XN3S-E	Master project 3 for study programme IS	Z	6
14XN3S-E	Master project 3 for study programme IS	Z	6
15XN3S-E	Master project 3 for study programme IS	Z	6
16XN3S-E	Master project 3 for study programme IS	Z	6
17XN3S-E	Master project 3 for study programme IS	Z	6
18XN3S-E	Master project 3 for study programme IS	Z	6
20XN3S-E	Master project 3 for study programme IS	Z	6
21XN3S-E	Master project 3 for study programme IS	Z	6
22XN3S-E	Master project 3 for study programme IS	Z	6
11XN4S-E	Master project 4 for study programme IS	Z	10
12XN4S-E	Master project 4 for study programme IS	Z	10
14XN4S-E	Master project 4 for study programme IS	Z	10
15XN4S-E	Master project 4 for study programme IS	Z	10
16XN4S-E	Master project 4 for study programme IS	Z	10
17XN4S-E	Master project 4 for study programme IS	Z	10
18XN4S-E	Master project 4 for study programme IS	Z	10
20XN4S-E	Master project 4 for study programme IS	Z	10
21XN4S-E	Master project 4 for study programme IS	Z	10
22XN4S-E	Master project 4 for study programme IS	Z	10

Name of the block: Elective courses Minimal number of credits of the block: 0 The role of the block: V

Code of the group: VP-NP-IS-EN Name of the group: Master Full-Time IS (EN) voluntary Requirement credits in the group: Requirement courses in the group: Credits in the group: 0 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
15JIA1-E	Foreign Language - English 1 Dana Boušová, Jitka He manová, Marie Michlová, Lenka Monková, Peter Morpuss, Markéta Vojanová, Eva Rezlerová, Markéta Musilová	Z	0	0P+2C	z	V
15JIF1-E	Foreign Language - French 1 Irena Veselková	Z	0	0P+2C	Z	V
15JIN1-E	Foreign Language - German 1 Eva Rezlerová, Martina Navrátilová, Jana Štikarová	Z	0	0P+2C	Z	V
15JIR1-E	Foreign Language - Russian 1 Marie Michlová	Z	0	0P+2C	Z	V
15JIS1-E	Foreign Language - Spanish 1 Nina Hricsina Puškinová	Z	0	0P+2C	Z	V
15JIA2-E	Foreign Language - English 2 Eva Rezlerová	Z	0	0P+2C	L	V
15JIF2-E	Foreign Language - French 2 Irena Veselková	Z	0	0P+2C	L	V
15JIN2-E	Foreign Language - German 2 Eva Rezlerová, Martina Navrátilová, Jana Štikarová	Z	0	0P+2C	L	V
15JIR2-E	Foreign Language - Russian 2 Marie Michlová	Z	0	0P+2C	L	V

15JIS2-E	Foreign Language - Spanish 2 Nina Hricsina Puškinová	Z	0	0P+2C	L	V
15JIA3-E	Foreign Language - English 3 Jitka He manová, Marie Michlová, Lenka Monková, Peter Morpuss, Markéta Vojanová, Eva Rezlerová, Markéta Musilová	Z	0	0P+2C	Z	V
15JIF3-E	Foreign Language - French 3 Irena Veselková	Z	0	0P+2C	Z	v
15JIN3-E	Foreign Language - German 3 Eva Rezlerová, Martina Navrátilová, Jana Štikarová	Z	0	0P+2C	Z	v
15JIR3-E	Foreign Language - Russian 3 Marie Michlová	Z	0	0P+2C	Z	v
15JIS3-E	Foreign Language - Spanish 3 Nina Hricsina Puškinová	Z	0	0P+2C	Z	v
15JIA4-E	Foreign Language - English 4 Eva Rezlerová	Z	0	0P+2C	L	v
15JIF4-E	Foreign Language - French 4 Irena Veselková	Z	0	0P+2C	L	v
15JIN4-E	Foreign Language - German 4 Eva Rezlerová, Martina Navrátilová, Jana Štikarová	z	0	0P+2C	L	V
15JIR4-E	Foreign Language - Russian 4	Z	0	0P+2C	L	v
15JIS4-E	Marie Michlová Foreign Language - Spanish 4	Z	0	0P+2C	L	v
	Nina Hricsina Puškinová	<u> </u>				
	courses of this group of Study Plan: Code=VP-NP-IS-EN Nam	e=iviaster Fu	II-I IME I	<u>5 (⊨N) VO</u>		
	reign Language - English 1		mant -f		Z	0
	d technical terminology. Lexical-grammatical structures of higher command. Formal la					•
	thin students' specialization field both in verbal and written forms. Language laborator nections, English Library, the Internet).	y environment us	sea alternati	vely as a too	n for active lea	arning
, <u> </u>					7	^
	reign Language - French 1	mucolf sh+	of forci-		Z	0 odvopood
Basic structures of foreign la groups texts with professiona	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself, phonetics	s or roreign	anguage, wi	iung skills, in	auvanced
					7	0
	reign Language - German 1				Ζ	0
-	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself, phonetics	s of foreign	language, wr	iting skills, in	advanced
groups texts with professiona					7	0
'	reign Language - Russian 1	mucelf phonetics	a of foreign		Z	0
groups texts with professiona	nguage, communication in everyday life, study, work, leiser time activities, introducing	mysell, phonetics	s or loreign	language, wi	iung skills, in	auvanceu
	· · · · · · · · · · · · · · · · · · ·				Z	0
'	reign Language - Spanish 1 nguage, communication in everyday life, study, work, leiser time activities, introducing	myself phonetics	s of foreign	anguage wi		•
groups texts with professiona		mysen, phonetics	s or loreign	anguage, wi	ning skiis, in	auvanceu
	reign Language - English 2				7	0
	d technical terminology. Lexical-grammatical structures of higher command. Formal la	nguage. Improve	ment of con	I Imunication		use of foreign
	hin students' specialization field both in verbal and written form. Language laboratory en	·				-
- English Connections, Engli			, .		3.	
	reign Language - French 2				Z	0
	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself, phonetics	s of foreign	language, wr	- 1	-
groups texts with professiona			0	00/	5	
15JIN2-E For	reign Language - German 2				Z	0
	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself, phonetics	s of foreign	language, wr	iting skills, in	
groups texts with professiona	al topics.					
15JIR2-E Foi	reign Language - Russian 2				Z	0
	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself, phonetics	s of foreign	language, wr	iting skills, in	advanced
groups texts with professiona						
	eign Language - Spanish 2				Z	0
	anguage, communication in everyday life, study, work, leisere time activities, introduci	ng myself, phone	tics of Span	ish language		
15JIA3-E Foi	reign Language - English 3				Z	0
	echnical discourse and style. Analysis of expert texts and their production. Preparation	for overseas wor	k engagem	ent. Optional	courses for c	ertificates
FCE, CAE.						
	reign Language - French 3				Z	0
, i i i i i i i i i i i i i i i i i i i	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself, phonetics	s or foreign	anguage, wr	iung skills, in	advanced
groups texts with professiona	· · · · · · · · · · · · · · · · · · ·				7	0
	reign Language - German 3 nguage, communication in everyday life, study, work, leiser time activities, introducing	myself phonotic	s of foreign		Z	0 advanced
groups texts with professiona		mysen, phoneuc	s or ioreign	anguaye, wi	ang aniia, ifi	aavanueu
	reign Language - Russian 3				Z	0
	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself. phonetics	s of foreign	l language wr	- 1	-
groups texts with professiona		,, p				
	reign Language - Spanish 3				Z	0
	nguage, communication in everyday life, study, work, leiser time activities, introducing	myself. phonetics	s of foreign	l language wr		-
groups texts with professiona		, soon, phonedos	s or lordigit	anguage, wi		aaranoou
	reign Language - English 4				Z	0
	echnical discourse and style. Analysis of expert texts and their production. Preparation	for overseas wo	rk enaaaem	ent. Optional	1	-
FCE, CAE.			.390			
,						

15JIF4-E	Foreign Language - French 4	Z	0			
Basic structures of forei	gn language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign langu	age, writing skills	, in advanced			
groups texts with profes	sional topics.					
15JIN4-E	Foreign Language - German 4	Z	0			
Basic structures of foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language, writing skills, in advanced						
groups texts with profes	sional topics.					
15JIR4-E	Foreign Language - Russian 4	Z	0			
Basic structures of forei	gn language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign langu	iage, writing skills	, in advanced			
groups texts with profes	sional topics.					
15JIS4-E	Foreign Language - Spanish 4	Z	0			
Basic structures of forei	gn language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign langu	lage, writing skills	, in advanced			
groups texts with profes	sional topics.					

### List of courses of this pass:

Code	Name of the course	Completion	Credits
11MAI-E	ITS Mathematical Tools	Z,ZK	4
	Series. Discrete Fourier Transform. Segmentation of signals, windows, localization. Short-term Fourier Transform. From Fourier Analys		nentals of
	umerical Mathematics. Numerical solutions to ODEs and PDEs. Continuous traffic flow models described by PDE. Car-following mod	1	
11MMAD-E	Mathematical Methods for Data Analysis	Z,ZK	6
	c modelling, estimation, prediction, filtration, control, methods of data analysis: k-means, DBSCAN, naive Bayes, decision trees, supp		
11XN1S-E	Master project 1 for study programme IS	Z	5
11XN2S-E	Master project 2 for study programme IS	Z	6
11XN3S-E	Master project 3 for study programme IS	Z	6
11XN4S-E	Master project 4 for study programme IS	Z	10
11XNDS-E	Master Thesis for study programme IS	Z	16
11XPXS-E	Training course for study programme IS	Z	4
12TDP-E	Traffic Flow Theory	Z,ZK	3
models. Macroscop	ated human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamentals an pic, statistical and microscopic models. Theory of shock waves, queuing theory and special theory of traffic phenomena. Relation bet flow management.	ween traffic model	s and traffic
12XN1S-E	Master project 1 for study programme IS	Z	5
12XN2S-E	Master project 2 for study programme IS	Z	6
12XN3S-E	Master project 3 for study programme IS	Z	6
12XN4S-E	Master project 4 for study programme IS	Z	10
12XNDS-E	Master Thesis for study programme IS	Z	16
12XPXS-E	Training course for study programme IS	Z	4
14CITS-E	C-ITS Systems	Z,ZK	6
-	will also cover signal processing. Microsimulation Models e of traffic modeling and simulation will be broaded by the application of traffic control algorithms to traffic microsimulation models us		
example, the propos	sal of algorithms for actuated signal control, pedestrian preference, dynamic network routing, road line traffic control, crossing security of Algorithms will be designed applied and tested by students themselves.	equipment, and PT	preference
14PAM-E	Algorithms will be designed, applied, and tested by students themselves.	Z,ZK	4
Object oriented pro	Programming and modelling gramming, dynamic memory allocation, inheritage, generic programming, STL, abstract data types, programming techniques, recurs m in nature and in real systems, paralel computer systems, paralel programming, discrete simulation, models of processes, model ty of analytical sources for modelling, BPMN language, SW Bizagi, model creation and life cycle.	ion, complexity, Lir	denmeyer's
14PD-E	Data processing	Z,ZK	6
	about tools for data processing and analysis, using practical examples to try out the most common options used in data processing, ilts of analyses. In advanced methods, students will also perform specific analysis using Bayesian networks. Students will then indepe on data from existing open systems.	•	•
14PPRP-E	Computer Aided Project Management	КZ	2
	ect? The basic terms a concepts of project management. Life cycle of the project and its phased approach. Analysis and specification		
	es, objectives and measurability. Risk events and risk planning. Project change management during implementation. Preparation of th restrictions, assignments, calendars etc.) Project planning and optimization - time, resources.		
14XN1S-E	Master project 1 for study programme IS	Z	5
14XN2S-E	Master project 2 for study programme IS	Z	6
14XN3S-E	Master project 3 for study programme IS	Z	6
14XN4S-E	Master project 4 for study programme IS	Z	10
14XNDS-E	Master Thesis for study programme IS	Z	16
14XPXS-E	Training course for study programme IS	Z	4
			//

15JIA1-E	Foreign Language - English 1	Z	0
	I texts and technical terminology. Lexical-grammatical structures of higher command. Formal language. Improvement of communication		
language in pres	entations within students' specialization field both in verbal and written forms. Language laboratory environment used alternatively as a (Programmes - English Connections, English Library, the Internet).	tool for active	learning
15JIA2-E	Foreign Language - English 2	Z	0
1	I texts and technical terminology. Lexical-grammatical structures of higher command. Formal language. Improvement of communication	—	-
	ations within students' specialization field both in verbal and written form. Language laboratory environment used alternatively as a tool for a		
	- English Connections, English Library, the Internet).		0
15JIA3-E	Foreign Language - English 3	Z	0
Presentation skills	- expert technical discourse and style. Analysis of expert texts and their production. Preparation for overseas work engagement. Option	al courses for o	certificates
	FCE, CAE.		
15JIA4-E	Foreign Language - English 4	Z	0
Presentation Skills	- expert technical discourse and style. Analysis of expert texts and their production. Preparation for overseas work engagement. Option	al courses for	certificates
	FCE, CAE.		-
15JIF1-E	Foreign Language - French 1	Z uriting okillo in	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language, groups texts with professional topics.	writing skills, in	advanced
15JIF2-E	Foreign Language - French 2	Z	0
	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	—	-
	groups texts with professional topics.	winning ontino, in	aavanooa
15JIF3-E	Foreign Language - French 3	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.		
15JIF4-E	Foreign Language - French 4	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.		1
15JIN1-E	Foreign Language - German 1	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.	7	0
15JIN2-E	Foreign Language - German 2	Z writing skills in	
Dasic structures of	groups texts with professional topics.	witting skills, in	auvanceu
15JIN3-E	Foreign Language - German 3	7	0
	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	_	-
	groups texts with professional topics.	0,	
15JIN4-E	Foreign Language - German 4	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.		
15JIR1-E	Foreign Language - Russian 1	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.	Z	0
15JIR2-E	Foreign Language - Russian 2	_	0 dvanced
	groups texts with professional topics.	writing skills, in	aavanoca
15JIR3-E	Foreign Language - Russian 3	Z	0
	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	—	_
	groups texts with professional topics.		
15JIR4-E	Foreign Language - Russian 4	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.		
15JIS1-E	Foreign Language - Spanish 1	Z	0
Basic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,	writing skills, in	advanced
	groups texts with professional topics.	7	^
15JIS2-E	Foreign Language - Spanish 2	Z	0
	es of Spanish language, communication in everyday life, study, work, leisere time activities, introducing myself, phonetics of Spanish language	iyuaye, writing	
15JIS3-E	Foreign Language - Spanish 3	ح: vriting skills	0 dvanced
Dasic structures of	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language, groups texts with professional topics.	witung skills, in	auvanceo
15JIS4-E	Foreign Language - Spanish 4	Z	0
	foreign language, communication in everyday life, study, work, leiser time activities, introducing myself, phonetics of foreign language,		
	groups texts with professional topics.		
15XN1S-E	Master project 1 for study programme IS	Z	5
15XN2S-E	Master project 2 for study programme IS	 Z	6
15XN3S-E	Master project 3 for study programme IS	Z	6
15XN4S-E	Master project 4 for study programme IS	Z	10
15XNDS-E	Master Thesis for study programme IS	Z	16
15XPXS-E	Training course for study programme IS	 Z	4
		4	4

16DITS-E		7 71/	1 4
Design of the w	Vehicles within ITS ehicle with focus on its use and function in frame of ITS. User requirement analyses. Economic aspects. Process of constructions in a	Z,ZK	4
-	I structure of the designed object. Creation of functional models. Energy management and storages for ground vehicles, energy trans		
dependences and	one. Propulsion systems / traditional and alternative ones. Life-cycle analysis.		ig to kineti
		7 74	2
16ESDP-E	Electronic systems in modern vehicles	Z,ZK	3
	de systems, electromobility, V2I and V2V, autonomous driving. Combustion engine control and electronic control units. Electric propul		
characteristics a	nd control. Management of hybrid propulsion for attaining its optimal efficiency. Vehicle communication bus (CAN, LIN, FlexRay etc.). comfort electronic vehicle systems. Practical exercises with real and simulated systems.	Salety, communic	Salion and
		7 71/	2
16KSD-E	Quality and reliability in area of transportation means and systems ed for design, manufacturing and operation. Methods QFD, DFM, DFA, DFS. Longtime testing. FMEA method. Operation reliability. M	Z,ZK	3
-	d quality improvement (Six Sigma etc.). Certification and accreditation, quality management, tools and methods for quality stabilization	-	
IUCESS DESIGN and	will work on real problems in the QFD laboratory.	in and improveme	ini. Siuue
16SHMI-E	Simulation and HMI	Z,ZK	3
	ystems in transportation and vehicle systems. User interface, HMI (human-machine interaction), virtual reality and computer graphics		-
	buting equipment. Creating computing models. Mechanic and dynamic systems and their mathematical models. Simulation of vehicle		
	particular. Virtual reality systems.	aynamico, on ian	a barnage
16XN1S-E	Master project 1 for study programme IS	Z	5
		Z	
16XN2S-E	Master project 2 for study programme IS		6
16XN3S-E	Master project 3 for study programme IS	Z	6
16XN4S-E	Master project 4 for study programme IS	Z	10
16XNDS-E	Master Thesis for study programme IS	Z	16
16XPXS-E	Training course for study programme IS	Z	4
17XN1S-E	Master project 1 for study programme IS	Z	5
17XN2S-E	Master project 2 for study programme IS	Z	6
		Z	6
17XN3S-E	Master project 3 for study programme IS		-
17XN4S-E	Master project 4 for study programme IS	Z	10
17XNDS-E	Master Thesis for study programme IS	Z	16
17XPXS-E	Training course for study programme IS	Z	4
18XN1S-E	Master project 1 for study programme IS	Z	5
18XN2S-E	Master project 2 for study programme IS	Z	6
18XN3S-E	Master project 3 for study programme IS	Z	6
18XN4S-E	Master project 4 for study programme IS	Z	10
		Z	
18XNDS-E	Master Thesis for study programme IS		16
18XPXS-E	Training course for study programme IS	Z	4
20AIMI-E	Application of ITS in Urban Engineering	Z,ZK	6
na coursa focusas	s mainly on the issue of the installation of engineering networks in the area, coordination of engineering activities in the area, organizati		
	olutions, design of systems for traffic and transport telematics management, coordination of transport modes - automobil, pedestrian,		
of public space so	olutions, design of systems for traffic and transport telematics management, coordination of transport modes - automobil, pedestrian, approaches to the development of Smart and green approaches Promoting into Public.	MHD, cyclo, mod	es etc. Ne
of public space sc 20BITS-E	olutions, design of systems for traffic and transport telematics management, coordination of transport modes - automobil, pedestrian, approaches to the development of Smart and green approaches Promoting into Public. Safety and reliability of ITS Systems	MHD, cyclo, mod	es etc. Ne
of public space so 20BITS-E The basic concept	olutions, design of systems for traffic and transport telematics management, coordination of transport modes - automobil, pedestrian, approaches to the development of Smart and green approaches Promoting into Public. Safety and reliability of ITS Systems ts of safety and reliability in the job and application. Basic schema and types of diagnostic systems including reliability diagnostics of	MHD, cyclo, mod KZ technical equipme	es etc. No 3 ent and I
f public space sc 20BITS-E he basic concept	olutions, design of systems for traffic and transport telematics management, coordination of transport modes - automobil, pedestrian, approaches to the development of Smart and green approaches Promoting into Public. Safety and reliability of ITS Systems ts of safety and reliability in the job and application. Basic schema and types of diagnostic systems including reliability diagnostics of ceptability and reliability prediction, traffic crity and sensitivity analysis. Neural Networks and other optimization algorithms and ETA,	MHD, cyclo, mod KZ technical equipme	es etc. No 3 ent and I
f public space sc 20BITS-E he basic concept avestigation of ac	Approaches to the development of Smart and green approaches Promoting into Public. Safety and reliability of ITS Systems ts of safety and reliability prediction, traffic crity and sensitivity analysis. Neural Networks and other optimization algorithms and ETA, traffic including operator testing on simulator and in real-world situatiation	MHD, cyclo, mod KZ technical equipme FMEA failure ana	es etc. No 3 ent and I <sup>-</sup> lysis. HM
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20TVHD-E	Telematics in Public Transport	Z,ZK	3
Ticketing and information sy	stems; foreinght experiences; vehicle technology; dispatching systems; Information Systems; data structures; clearing	; Public Transport prefere	nces; vehicle
	position monitoring; legislative framework; standardization, certification and interoperability.		
20XN1S-E	Master project 1 for study programme IS	Z	5
20XN2S-E	Master project 2 for study programme IS	Z	6
20XN3S-E	Master project 3 for study programme IS	Z	6
20XN4S-E	Master project 4 for study programme IS	Z	10
20XNDS-E	Master Thesis for study programme IS	Z	16
20XPXS-E	Training course for study programme IS	Z	4
21XN1S-E	Master project 1 for study programme IS	Z	5
21XN2S-E	Master project 2 for study programme IS	Z	6
21XN3S-E	Master project 3 for study programme IS	Z	6
21XN4S-E	Master project 4 for study programme IS	Z	10
21XNDS-E	Master Thesis for study programme IS	Z	16
21XPXS-E	Training course for study programme IS	Z	4
22XN1S-E	Master project 1 for study programme IS	Z	5
22XN2S-E	Master project 2 for study programme IS	Z	6
22XN3S-E	Master project 3 for study programme IS	Z	6
22XN4S-E	Master project 4 for study programme IS	Z	10
22XNDS-E	Master Thesis for study programme IS	Z	16
22XPXS-E	Training course for study programme IS	Z	4

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