Study plan

Name of study plan: Master Full-Time IS (EN) from 2025/26

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: 76
Elective courses credits: 44
Sum of credits in the plan: 120
Note on the plan:

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:

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
11XN1S-E	**Master project 1 for study programme IS** *Evženie Uglickich, Bohumil Ková , Jan P ikryl* **Jan P ikryl** *Evženie Uglickich (Gar.)*	Z	5	0P+4C	Z	ZP
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** *Martin Leso*	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** *Evženie Uglickich, Bohumil Ková , Jan P ikryl* **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** *Martin Šrotý , Zden k Lokaj, Tomáš Zelinka*	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** *Martin Leso*	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** *Bohumil Ková* **Bohumil Ková** 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: Compulsory courses
Minimal number of credits of the block: 49
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:

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, David Lehet, Filip Kotas, 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 **Pavel 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.			
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 of other GIS related technologies such as problem mapping, webmap, etc.			
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** *Petr Bouchner, Dmitrij Rožd stvenský*	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 associated human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamentals and applications of mathematical models. Macroscopic, statistical and microscopic models. Theory of shock waves, queuing theory and special theory of traffic phenomena. Relation between traffic models and traffic flow management.				
16ESDP-E	Electronic systems in modern vehicles		Z,ZK	3
Advanced vehicle systems, electromobility, V2I and V2V, autonomous driving. Combustion engine control and electronic control units. Electric propulsion, its components, basic characteristics and control. Management of hybrid propulsion for attaining its optimal efficiency. Vehicle communication bus (CAN, LIN, FlexRay etc.). Safety, communication and comfort electronic vehicle systems. Practical exercises with real and simulated systems.				
20MZZ-E	Modern techniques of safety control of moving railway vehicles		Z,ZK	3
ERTMS / ETCS concepts, ETCS architecture and interface descriptions, ERTMS system level, infrastructure and mobile part of the system, linking to stationary security systems, operating and application modes of the system, infrastructure orientation, interface (DMI), integration of the ETCS mobile part into the driving vehicle, GSM-R functional specification, testing and legislation.				

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	**C-ITS Systems** *Zden k Lokaj, Tomáš Zelinka, Miroslav Vaniš* **Zden k Lokaj** *Zden k Lokaj (Gar.)*	Z,ZK	6	3P+3C	L	z
14PAM-E	**Programming and modelling** *Vít Fábera, Tomáš Brandejský, Marek Kalika, Martin Fiala* **Vít Fábera** *Vít Fábera (Gar.)*	Z,ZK	4	2P+2C	L	z
14PD-E	**Data processing** *Martin Šrotý , Miroslav Vaniš* **Michal Je ábek** *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 funcionality with focus on data exchange (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, recursion, complexity, Lindenmeyer's grammars, paralism in nature and in real systems, paralel computer systems, paralel programming, discrete simulation, models of processes, model 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 processing, including advanced options for presenting the results of analyses. In advanced methods, students will also perform specific analysis using Bayesian networks. Students will then independently perform 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 of the assignment, 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				

Code of the group: 2S-NP-IS-EN-V-21/22
Name of the group: 2nd 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
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** *Tereza Kunclová, Petr Bouchner, Stanislav Novotný, 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 traffic modeling and simulation will be broaded by the application of traffic control algorithms to traffic microsimulation models used in ITS. These include, for example, the proposal of algorithms for actuated signal control, pedestrian preference, dynamic network routing, road line traffic control, crossing security equipment, and PT preference. Algorithms will be designed, applied, and tested by students themselves.				
16SHMI-E	Simulation and HMI		Z,ZK	3
Simulation for the systems in transportation and vehicle systems. User interface, HMI (human-machine interaction), virtual reality and computer graphics for ITS. Simulation theory with application of computing equipment. Creating computing models. Mechanic and dynamic systems and their mathematical models. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems.				
20ITSR-E	ITS - R		Z,ZK	3
The introduction is devoted to description of the architecture and interface of the system with the ITS-R concept, the communication interface of the system, principles of ensuring functional and security features are defined. The principles of ERTMS / ETCS application level 3, UGTMS, CBTC are discussed in detail. Current and future communication technologies are described.				

List of courses of this pass:

Code	Name of the course	Completion	Credits
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.			
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
12TDP-E	Traffic Flow Theory	Z,ZK	3
Mobility and associated human problems. Basic traffic parameters and their measurement. Estimation of quality of services. Theoretical fundamentals and applications of mathematical models. Macroscopic, statistical and microscopic models. Theory of shock waves, queuing theory and special theory of traffic phenomena. Relation between traffic models and traffic flow management.			
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
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 funcionality with focus on data exchange (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.			
14MIM-E	Microsimulation Models	KZ	3
Basic knowledge of traffic modeling and simulation will be broaded by the application of traffic control algorithms to traffic microsimulation models used in ITS. These include, for example, the proposal of algorithms for actuated signal control, pedestrian preference, dynamic network routing, road line traffic control, crossing security equipment, and PT preference. Algorithms will be designed, applied, and tested by students themselves.			
14PAM-E	Programming and modelling	Z,ZK	4
Object oriented programming, dynamic memory allocation, inheritance, generic programming, STL, abstract data types, programming techniques, recursion, complexity, Lindenmeyer's grammars, paralism in nature and in real systems, paralel computer systems, paralel programming, discrete simulation, models of processes, model 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 processing, including advanced options for presenting the results of analyses. In advanced methods, students will also perform specific analysis using Bayesian networks. Students will then independently perform 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 of the assignment, 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.			
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
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
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.		
16ESDP-E	Electronic systems in modern vehicles	Z,ZK	3
	Advanced vehicle systems, electromobility, V2I and V2V, autonomous driving. Combustion engine control and electronic control units. Electric propulsion, its components, basic characteristics and control. Management of hybrid propulsion for attaining its optimal efficiency. Vehicle communication bus (CAN, LIN, FlexRay etc.). Safety, communication and comfort electronic vehicle systems. Practical exercises with real and simulated systems.		
16SHMI-E	Simulation and HMI	Z,ZK	3
	Simulation for the systems in transportation and vehicle systems. User interface, HMI (human-machine interaction), virtual reality and computer graphics for ITS. Simulation theory with application of computing equipment. Creating computing models. Mechanic and dynamic systems and their mathematical models. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems.		
16XN1S-E	Master project 1 for study programme IS	Z	5
16XN2S-E	Master project 2 for study programme IS	Z	6
16XN3S-E	Master project 3 for study programme IS	Z	6
16XN4S-E	Master project 4 for study programme IS	Z	10
17XN1S-E	Master project 1 for study programme IS	Z	5
17XN2S-E	Master project 2 for study programme IS	Z	6
17XN3S-E	Master project 3 for study programme IS	Z	6
17XN4S-E	Master project 4 for study programme IS	Z	10
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
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		
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 of other GIS related technologies such as problem mapping, webmap, etc.		
20ITSR-E	ITS - R	Z,ZK	3
	The introduction is devoted to description of the architecture and interface of the system with the ITS-R concept, the communication interface of the system, principles of ensuring functional and security features are defined. The principles of ERTMS / ETCS application level 3, UGTMS, CBTC are discussed in detail. Current and future communication technologies are described.		
20MZZ-E	Modern techniques of safety control of moving railway vehicles	Z,ZK	3
	ERTMS / ETCS concepts, ETCS architecture and interface descriptions, ERTMS system level, infrastructure and mobile part of the system, linking to stationary security systems, operating and application modes of the system, infrastructure orientation, interface (DMI), integration of the ETCS mobile part into the driving vehicle, GSM-R functional specification, testing and legislation.		
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.		
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
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
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

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