Recomended pass through the study plan

Name of the pass: Intelligent Buildings - valid from 2020

Faculty/Institute/Others: Faculty of Electrical Engineering Department: Pass through the study plan: Inteligentní budovy - platný od roku 2020 Branch of study guranteed by the department: Welcome page Guarantor of the study branch: Program of study: Intelligent Buildings Type of study: Follow-up master full-time Note on the pass:

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of ser	nester: 1					
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
BEZM	Safety in Electrical Engineering for a master's degree Vladimír K la, Radek Havlí ek, Ivana Nová, Josef ernohous, Pavel Mlejnek Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	z	Ρ
124KPKP	Building Structures - Final Review Ctislav Fiala Ctislav Fiala Ctislav Fiala (Gar.)	ZK	4	3P	Z	Ρ
124OSIB	Lighting and Acoustics Jaroslav Vychytil, Lenka Maierová Jaroslav Vychytil Jaroslav Vychytil (Gar.)	KZ	4	2P	Z	Ρ
2161108	Transport Phenomena Martin Barták Martin Barták Martin Barták (Gar.)	Z,ZK	4	2P+1C	*	Ρ
A5M14RPI	Distribution of Electric Energy and Drives Ji í Lettl, Pavel Mindl, Jan Bauer Ji í Lettl Ji í Lettl (Gar.)	Z,ZK	5	2P+1L	Z	Ρ
124ST1	Thermal Engineering in Construction 1 Jan Tywoniak Jan Tywoniak Jan Tywoniak (Gar.)	ZK	5	2P	Z	Ρ
		Min. cours.				
	Povinn volitelné p edm ty programu	8	Min/Max			
2020_MIBPV	2162035,2151154, (see the list of groups below)	Max. cours.	32/92			PV
		23				

Number of sem	ester: 2					
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
125ESB	Buildings Ecology Systems Stanislav Frolík Stanislav Frolík (Gar.)	KZ	4	2P	L	Р
125EABU	Energy Audit of Building Karel Kabele, Miroslav Urban, Michal Kabrhel Karel Kabele Karel Kabele (Gar.)	КZ	4	2P+1C	L	Ρ
2161109	Automatic control in environmental engineering of building Ji í Bašta, Jind ich Bohá Ji í Bašta Ji í Bašta (Gar.)	Z,ZK	4	2P+1C	*	Ρ
A5M38SZS	Sensors and Networks Pavel Ripka, Antonín Platil Antonín Platil Pavel Ripka (Gar.)	Z,ZK	4	2P+1L	L	Ρ
2161567	Ventilation and Air Conditioning Vladimír Zmrhal, Miloš Lain Vladimír Zmrhal Vladimír Zmrhal (Gar.)	Z,ZK	4	2P+1C	2	Ρ
		Min. cours.				
	Projekt 1	1	Min/Max			
2020_MIBPRO1	2163033,125PIB1, (see the list of groups below)	Max. cours.	6/6			Р
		1				
	Povinn volitelné p edm ty programu	Min. cours.	Min/Max			
2020_MIBPV	2162035,2151154, (see the list of groups below)	8	32/92			PV

Max. cours.		
00		
23		

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
2161102	Radiant and Industrial Heating Ji í Bašta, Jind ich Bohá Ji í Bašta Ji í Bašta (Gar.)	Z,ZK	4	2P+1C	*	Р
B5M99SCT	Technology for Smart Cities Lukáš Ferkl Lukáš Ferkl Lukáš Ferkl (Gar.)	Z,ZK	4	2P+1C	Z	Р
2020_MIBPRO2	Projekt 2 2163034,125PIB2, (see the list of groups below)	Min. cours. 1 Max. cours. 1	Min/Max 6/6			Ρ
2020_MIBPV	Povinn volitelné p edm ty programu 2162035,2151154, (see the list of groups below)	Min. cours. 8 Max. cours. 23	Min/Max 32/92			PV

Number of ser	mester: 4					
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
ADIP26	Diploma Thesis	Z	26	36s	L	Р
		Min. cours.				
	Povinn volitelné p edm ty programu	8	Min/Max			
2020_MIBPV	2162035,2151154, (see the list of groups below)	Max. cours.	32/92			PV
		23				

List of groups of courses of this pass with the complete content of members of individual groups

Kód		Name of the group of group (for specification	courses and on see here or	codes of members of this below the list of courses)	Com	pletion	Cred	ts Scope	Semester	Role
2020_MIE	BPRO1		Projekt 1			cours. 1 . cours. 1	Min/N 6/6			Ρ
2163033	Design IB	l.	125PIB1	Project 1		A5M99P	R1	Project 1		
			•		Min.	cours.				
2020 MIE	SPRO2		Projekt 2			1	Min/N	ax		Р
2020_1112			FIOJERI Z		Max.	cours.	6/6			•
						1				
2163034	Project IB	II.	125PIB2	Project 2	L	A5M99P	R2	Project 2	1 1	
					Min.	cours.				
						8	Min/N	ax		
2020_M	IBPV	Povinn ve	olitelné p edn	n ty programu	Max	cours.	-			PV
						23				
2162035	Alternative	Energy Sources	2151154	Refrigertion and heat pumps		A5M16E	UE	Economics of	Energy Use	
A5M15ES1	Electrical L	.ight 1	A5M34EZS	Electronic security systems		A5M34E	LE	Electronics		
125EIBB	Electroeng	ineering and intellige	2162700	Experimental Methods 1		A5M16F	Р	Corporate fina	ince	
A5M13FVS	Photovolta	ic Systems	124INBB	Integrated Design of Buildings		A5M38M	EB	Measurement	s in the Buildin	gs
125MEC	Simulation	of Building Energy Pe	A5M13NZZ	Independent sources		1250ZE	3	Renewable Er	nergy Sources	
125PBZB	Fire Servic	es	2162019	Industrial Heating, Ventilation,		A5M38S	BD	Collection and	Data Transfer	

2162064	Noise and Vibration Control	125SYB	Building Systems	125TECE	Technological Units
2162113	Heating	2162066	Heat Supply		

List of courses of this pass:

1241NB Integrated Design of Buildings Z/K 4 The main opporter of the subject integrated building beains to be an correct occurs the integrated building design. Ite cycle assessment of useful and subject integrated building structures. For all Review Z/K 4 Balaci of building structures. Fund Review Z/K 4 Balaci of building Structures. Find Review Z/K 4 Balaci of building Structures. Find Review Z/K 4 Balaci of building Structures. Find Review Z/K 4 Balaci of building Structures. Find Review Z/K 4 Balaci of building structures. Find Review Z/K 4 124CSIB The course introduces students to the basic of building lighting tectrotopy and students, and twentpers. Fund through basic in thromation is building and the students and theores thurter Method and and provide the students and thromation is building and theorem of building. Britematic Building and course is and thromation is building and thromation and thromatis and thromation is building and thromation is build	Code	Name of the course	Completion	Credits
The man algebraic of the subject Integrated Building Design is to get an Complex coveries of the principles of integrated buildings descript. Beyo escassisment of buildings, evaluations of the control interformation. Social and experimental, social and control is accessed on the buildings, evaluations of the subject of the subject and system. Spatial and setting and intervent structures are interesting and intervent structures are interesting and intervent structures. Subject and structures are intervent structures are intervent structures are intervent structures are intervent and structures are intervent structures. Structures are intervent intervent structures are intervent and structures are intervent structures are intervent and intervent and structures are intervent and and are intervent and and are intervent and and are intervent and and and are intervent and area intervent and a			-	4
124KPKP Building Structures - Final Review ZK 4 Basics of building structures, where applies the structure structures, structures, structure structures, structure				s, evaluation
Basics of building sinchures. Functional requirements, structure systems, apoilal effect of the structural system Vertical back-barring structures, structural systems, structural systems	of b	uilding performance, green/sustainable certification systems and understand environmental, social and economic aspects of the buil	lt environment.	
Envelope of buildings, windows, partitions, loors, supernoted callings, Statis, roof construction - threber root trauses, root envelopes, Foundation structures, structures and structures. Structures and structures. Structures and structures. Structure and structures and struc			1	-
substructure, weterpreding of the substructure, Structure) systems of angle and multi-storey buildings, structure systems of long-span structures. 1240 SI 104 The course introduces students to the basics of building lipting technology are building acousts and depends further knowledge. 1245 I The subject discusses the basics chapters of boilding, by-size, part typodhermal performance of buildings, the anownive manner with the and providing basic information to substructures. 125EABU I Energy Audit of Building Admonst course for introduction intervents on buildings. Energy audit and energy performance of buildings, liquitation. EPDB - energy performance discusses the basics of buildings. Metodobay of actuating energy performance of buildings environment protection. Full performance of buildings and the substructure of environment protection. Full performance of buildings and the full performance of buildings environment is boarded in the realistic building environment protection. Full performance of buildings and the substructure of environment protection. Full performance of an wetane one performance of buildings environment is buildings environment is building environment is buildings. Test full performance of action and cubote environment is partneres. Full performance of environment is partneres. Full performance of environment performance of environment is building. Full performance	-			-
124OBE Lighting and Acoustics KZ 4 124ST1 The curve introduces students to the basis of huiding lighting unchanges and building acoustics and deepnes further knowledge. ZK 5 The subject discusses the basis of huiding physics performance of buildings in an overview mamer with the aim of providing basic information to tadents coming from non-construction backetor's fields and at the same line supplementing in anotaview mamer with the aim of providing basic information to tadents coming from non-construction backetor's fields and at the same line supplementing in anotaview mamer with the aim of providing basic information construction backetoris fields and at the same lines supplementing in anotaview and parts. Same energy mole manace and same supplementing same and parts. Same energy tend individuels neergy mole manace and parts. Same energy and direct and parts and parts. Same energy method same and parts. Same energy and direct and parts and parts and parts. Same energy method same and parts. Same energy and direct and parts and anotages and parts				ution of the
The course introduces subulating lighting technology and building acousts and despend turber knowledge. 124ST1 Thermal Engineering in Construction 1 ZK 5 The subject discusses the basic chapters of building physics - part hypothermal performance of buildings in an every were manner with the contexts for students common from out engineering. 125EABU KZ 4 Advanced course tor introduction into energy subting. Excert shall and energy performance of buildings, lighting, untertained and energy excert students common and the context for students common on excert shall and energy excert shares to buildings. KZ 4 Advanced course tor introduction into energy subting course fiften, were advanced to buildings evaluation. Semiars is located on the masures on a specific cipics. Synappic impact of energy saving measures. Encorrelate availation, evaluation, feering in Construction and evaluation. Semiars is located on the masures on a specific cipics. Synappic impact of energy saving measures. Encored on the malest buildings evaluation. Semiars is located on the malest buildings evaluation. Semiars is located on the malest building evaluation. Semiars is located on the malest buildings evaluation. Semiars is located on the realistic buildings evaluation. Semiars is located on the realistic buildings evaluation and evaluation. Semiars is located on the malest building evaluation. Semiars is located on the malest evaluation. Semiars is located on the realistic buildings. The semiars is located on the realistic buildings evaluation. Semiars is located on the semiars is located on the realistic buildings. Subters is located on the realistic buildings evaluatis and enerege avaint on the semiars is located on the semiars is			1	4
The subject discusses the basic chapters of building physics - part hygoritermal performance of buildings. In an overview manner with the aim of providing basic information is subjected in construction bachelor's fields and at the same time supplementing howelds get and likely and with contexts for students for students. The Star Vice and the same time supplementing howelds get and likely and with contexts for students. The Star Vice and and the same time and parts. Samely energy flow diagram Analysis of Initial condition, description of Initial Condition of Initial Condition of Initian Condition, description Condition, description Condition, description Condition, description, description, description, description, description, description, de			1	
coming from non-construction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming from avid engineering. 125E FAB Energy Audit of Sulfiling KZ 4 Advanced course for introduction into energy audit and energy parformance of buildings. Regilation continues for students of the students of nergy consumption - building, heating, institution systems, technologies. Application of energy counter of the students of heat. Steps towards and ensuits on the students of energy counter of the students. Semiar is focused on the teallistic buildings of energy audit and ensuits on the students. Semiar is focused on the teallistic buildings of energy audit and ensuits on the students. The function of energy counter of the students on the students. Semiar is focused on the teallistic buildings of environment protection. Evaluation - emission Individual dojort anyme, Energy audit of industrial dojorts. Methods of buildings education. Semiar is focused on the teallistic buildings of environmental partners. The function applications. The fundamental leas is to save energy, materials and ensure of primari doort and auditor environmental partners. The fundamental environmental building equiparts. The fundamental dose is to save energy. Material and stop environmental buildings. Stoppitation of the student on the student student on the student on the student on the student on the stu	124ST1	Thermal Engineering in Construction 1	ZK	5
125EBABU KZ 4 Advanced course in indexiction is onergy auditing. Lengray audit an encryp reformance of buildings. Elegistion. EPD: - nergy course performance directive for indication, description of initial condition, walkaten from the aspect of environment protection. Evaluation - emission Individual delets surve, Encreming and initiality field by setting and initiality of the aspect of environment protection. Evaluation - emission Individual delets surve, Encreming and initiality field by setting and initiality in presenting case study report about energy audit of advatting building. KZ 4 125EIBB Electronerg/intering and initiality eleption building energy environmental bia as to save energy materials and ensure optimal indoor and outdoor environmentally finandly water management. Discostal develoas weat and search materia, discorting applications. The fundamental bias is to save energy materials and ensure optimal indoor and outdoor environmentally finandly water management. Discostal develoas weat and search materia, description, system design, punpting devices. Weat and search material bias and the activation in termination on a system search and a standard and annotable. Discostal develoas weat and search material bias and search and annotable in addition. The annotable energy sucres. Terminate a search and there to use is involved beam and bias of sovie and and annotable. The addition develoas and bias bias bias bias of sovie as a subtain the addition develoas in additin additing energy sublas and the envise in teadition and annutada			-	
Advanced course for introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings. Every audit - proceedure and parts: Sankay energy five diagram. Analysis of initial condition develops expension in measures an sequencing invest of energy saving measures. Expension of a net steps travel and survey of project documentation. Determining source officiency, distribution and emission of heat. Steps travely mode and served and receives and search of a dealty consumption - building. heating, including systems, technologies. Application of measures an seguencial context. Small, and the event of experiments of environment protection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings: evaluation. Seminar is focused on the realistic buildings regulations and evaluations. The Influence of electromagnitic environmental lates is to save ensergy. materials and ensure optimal indoor and outdoor environmental parameters. The Influence of electromagnitic environmental electromagnetic environmental parameters. The Influence of electromagnetic environmental electromagnetic environmental sectors are setting and search or a low far water of water consumption. System design, pumping devices, water savets is and out an experimana education of Buildings Ecology Systems. KZ 4 Principles of environmental parameters. The Influence electromagnetic environmental electromagnetic environment			-	
Methodogy of calculating energy performance of buildings. Energy audit - procedure and parts: Sanky energy flow darger mathysis of initial condition. description of initial condition. Object survey and unvey of project documentation. Determining source efficience, distribution and emission of holdwales. Secondaria of energy computing to presenting cases study report about energy audit of indexed or buildings evaluation. Saminar is focused on the realisate buildings resultation actively, intalligent systems, new technologies significantly influence virious HVAC system septiations. The fundamental idea is to save energy, materials and ensure optimal indoor and outdoor environmental parameters. The influence virious HVAC system septiations. The fundamental idea is to save energy, materials and ensure optimal indoor and outdoor environmental parameters. The influence virious HVAC system septiations. The fundamental idea is to save energy, materials and ensure optimal incord indoor and outdoor environmental parameters. The influence virious HVAC system septiations. KZ 4 125EESB Buildings Encology Systems KZ 4 126MEC Simulation of Buildings Encology Systems KZ 4 The course is aimed at explaining the issues of motelling and simulation of energy behaviour. Methodoge of energy Networkset (Networkset Networkset Network				
object survey and survey of project documentation. Determining source efficiency, distribution and emission of heat. Steps twards reduction of energy consumption - building, heating, liphing, ventilating systems, technologies. Application of measures an a special cipmact of energy saving measures. Economical availation, evaluation for the aspect of environment protection. Evaluation - emission individual cipies survey. Energy audit of existing building. 125EIBB Electroengineering and intelligent buildings for data energy audit of existing building. 125EIBB Electroengineering and intelligent buildings for data energy audit of existing building. 125EBB Building Ecology Systems K2 4 4 Principles of environmentally friendly water management. Disposal of sevage water and use of rain water. Measurement of water consumption, system design, pumping devices, water a system apprach to solve the whole compixe of HVAC and intelligent withing. 125EMEC Simulation of Building and simulation of energy betromance (economisping and special installations). 125MEC K2 4 The course is simulat a explaining the issues of modelling and simulation of energy betraviour of buildings. Students will be introduced to an overview of tools and methodologies for solving the septomers and lean how to use the simulation of energy betraviour of buildings. Students will be introduced to inmaterials. Construction and other factors affecting building betraviour. The aim of the course is no provide students with bask knowledge and practical experimers in modeling and simulating betraviour. 125OZEB Renewable Energy Sources Z Z 4 Fire water, hydrant systems, fire pape, fire status frame and base in the site of methy settem status us nerewable energy sources and wilding water with water miss, fram, and halon. Special fire-(firthing and systems that us nerewable energy sources and use of institute and and set of energines and prove and asystem in the course status of the energines and the interfaculty disciple functing and				-
of environment protection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is focused on the realistic buildings resulted of existing buildings. KZ 4 The information society, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental idea is to save energy, materials and ensure a system approach to solve the whole complex of HVAC and intelligent elvices in buildings requires a system approach to solve the whole complex of HVAC and intelligent elvices. In buildings evaluates a system approach to solve the whole complex of HVAC and intelligent elvices in buildings requires a system approach to solve the whole complex of HVAC and intelligent elvices. In buildings elvices, water as used of anit water. Measurement of water consumption, system design, pumping devices, water sum and special installations. 125EVEC SIMULATION of Buildings Ecology Systems 125EVED SIMULATION of Buildings Ecology Systems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to an overvice of tools and methodologies for avoing these problems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to an overvice of tools and methodologies for the accessible and simulating building energy Systems. The different types of energy-software with basis control addition the activation and building energy Systems. The different types of energy-software in undelling and simulating and ensure that use renewable energy sources and building energy systems. The different types of energy-software in the field sing and ensure that use renewable energy sources. Interview the text were the entergies and the field single statement is to accesse of the energies and the most appropriate with water institute the interview of the energies and the most appropriate methods of use are descrited. Altentins in splat to understanding the correct way to descli			-	
resulting to presenting case study report about energy sudit of existing building. KZ 4 The information society, intelligent systems, new technologies significantly influence various HVAC system application. The fundamental idea is to save energy, materials and ensure optimal neor and outdoor environmental parameters. The influence of electromagnetic onvironment, electromagnetic complexed HVAC system application of intelligent devices in buildings requires a system approach to solve the whole complex of HVAC and intelligent wing. 125ESB Buildings Ecology Systems KZ 4 Principles of environmentally friendly water management. Disposal of severage water and use of rain water. Measurement of water consumption, system design, pumping devices, water saving and special installations. KZ 4 The course is almost at explaining the issues of modelling and simulation of Building Energy Performance KZ 4 The course is almost at explaining the issues of modelling and simulation of the value is the back knowledge and practical experience in modelling and simulation building energy behavior. KZ 4 The course devision the issues of modelling and simulation of the provide students with back knowledge and practical experience in modelling and simulation building energy behavior. KZ 4 The course loss with rerewable energy sources and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design facilities and systems that use renerevabla energy sources. ZK <				
125EIBB Electroengineering and intelligent buildings KZ 4 The information society, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental lea is to save energy, materials and ensure optimal indoor and outdoor environment, electromagnetic compatibility, application of intelligent devices is buildings records where and building sectors of intelligent devices. 4 125ESB Buildings Ecology Systems KZ 4 Principles of environmentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system design, pumping devices, water saving and special installations. KZ 4 125MEC Simulation of Building Energy Performance KZ 4 The course is aimed at explaining the issues of modelling and simulation of energy behaviour. Issue and a practical experience in modelling and simulation software Designibulifet. In addition, they wills be introduced to an overview of tools and methodologies for software been set of the not use to a simulation software Designibulifet. The addition, they wills be introduced to alimet detas, materials, construction and other factors affecting building second subtains with basic knowledge and practical experience in modelling and simulation building second subtains with basic knowledge and practical experience in modelling and simulation and the course is to provide subtains. The different types of energy-solar, wind, biomass, geothermal and hydro-atter discussed in detail. The course datas with renevable energy sources. ZK 4	of environment prot		cused on the realis	tic buildings
The information society, intelligent systems, new technologies significantly influence various FWZ system applications. The fundamental idea is to save energy, materials and ensure optimal indoor and outdoor environment, alexater or environmentally friendly water management. Disposal of sevage water and use of rain water. Measurement of water consumption, system design, purpring devices, water reasoning and special installations. 125MEC Simulation of Building Dergry Performance KZ 4 The course is almed at explaining the issues of modeling and simulation of energy behaviour, of buildings. Students will be introduced to an overview of tools and methodologies for solving bees problems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to an overview of tools and methodologies for solving betaviour. The aim of the course is and the course is a provide students with basic knowledge and practical experience in modeling and simulation building energy solutions of the average of the energies and here or solve is to provide students with basic knowledge and practical experience in modeling and simulation building energy solutions of the energies and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design facilities and systems that use renewable energy sources and building energy systems. The different types of a nergy solution sing the system state of environment. Electron environment, electrondege from the Bachalor's degree to the disciplines. In the project, the student demonstrates the ability to independently develop a project in the field of intelligent buildings and systems that use renewable energy sources. The student demonstrates the ability to independently develop a more advanced project in the field of intelligent buildings. Studen			V7	4
cptimal indoor and outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intelligent devices in buildings requires a system approach to solve the vhole complex of HVAC and intelligent uting. KZ 4 Principles of environmentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system design, pumping devices, water saving and special installations. KZ 4 The course is aimed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of tools and methodologies for solving these problems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to an advantation building energy behaviour. A 1250/ECE Renewable Energy Sources ZK 4 The course deals with renewable energy sources and building energy systems. The different types of energy-sources KZ 4 The course deals with renewable energy sources. Fire Services KZ 4 Project 1 Project 1 Z 6 Project 2 Fire Services KZ 4				-
a system approach to solve fine whole complex of HVAC and intelligent wiring. KZ 4 125ESB Buildings Ecology Systems KZ 4 Principles of environmentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system design, pumping devices, water saving and special installations. KZ 4 The course is aimed at explaining the issues of modelling and simulation of energy behaviour. To buildings. Students will be introduced to an overview of tools and methodologies for solving these problems and learn how to use the simulation software DesignBuilding. In addition, they will be introduced to climate data, metrialis, construction and other factors affecting behaviour. The submit of the course is to provide students with basic knowledge and practical experience in modelling and simulating building energy behaviour. 1250ZEB Renewable Energy Sources ZK 4 The course dies with nerewable energy sources. ZK 4 125PBZB Fire soulce diegy submit Elevendry sources. KZ 4 125PBZB Fire soulce and the interfaculty course intelligent buildings. Is content is focused on the issue of intelligent buildings using a thorough analysis of the current state of the art from the interfacult ocurse in the elever of the interfaculty dourse intelligent buildings. Is content is focused on the issue of intelligent buildings using a thorough analysis of the current state of the art from the literature. Z 6 Project 1 the subl				
Principles of environmentally friendly water management. Disposal of sewage water and <u>use</u> of rain water. Measumement of water consumption, system design, pumping devices, water saving and special installations. 125MEC Simulation of Building Energy Performance KZ 4 The course is aimed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overve of tools and methodologies for solving these problems and learn how to use the simulation of energy behaviour. The aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating building energy behaviour. 1250ZEB Renewable Energy Sources ZK 4 The course deals with newable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal and hydro-are discussed in detail. The characteristics of the energies and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design facilities and systems that use renewable energy sources. 125PB2B Fire Services KZ 4 Project 1 Z 6 Project 1 Project 1 Z 6 Project 2 Project 2 6 Project 2 Project 2 6 Project 2 Project 2 6 Project 2 Project 4 4 125PIB2 Project 2				0
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125MEC Simulation of Building Energy Performance KZ 4 The course is aimed at explaining the issues of modeling and simulation of energy behaviour of buildings. Students will be introduced to an overview of tools and methodologies for solving these problems and learn how to use the simulation software DesignBuilding. In addition, they will be introduced to climate data, materials, construction and other factors affecting building behaviour. The aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating building energy behaviour. 125OZEB Renewable Energy Sources ZK 4 The course deals with renewable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal and hydro-are discussed in detail. The characteristics of the energies and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design facilities and systems that use renewable energy sources. 125PBZB Fire Vater. Fire Services KZ 4 Fire water.hydrant systems, fire pipe, fire station. Fixed fire-fighting water with water mist, foam, and halon. Special fire-fighting equipment. Protecting buildings against fire spread from technological equipment. Electric fire atarm. Fire control equipment. Backup power source. Z 6 Project 1 Project 1 Project 2 C 6 Project 2 Itelligent buildings. Its content is focused on the liseau of inteligent buildings and plants and op	Principles of enviro		lesign, pumping de	vices, water
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2161102 Radiant and Industrial Heating Z,ZK 4	of multistage cycles		-	nt systems,
	2161102			4
	2101102	Radiant and industrial meating Student will be informed about the basics of radiant and other industrial heating systems	<u>2,2</u> r	4

	Transport Phenomena	Z,ZK	4
2161109	Basics of transport phenomena for the study programme Intelligent Buildings. Momentum, heat and mass transport in built enviro Automatic control in environmental engineering of building	Z,ZK	4
	ation of basic approaches to automatic control of HVAC systems and equipments. Automatic control sequences of air conditioning and		
2161567 Main knowledge for	Ventilation and Air Conditioning r design, control and evaluation of ventilation and air conditioning systems. Design according to demands for treatment of thermal and	Z,ZK d humidity state a	4 A quality of
0400040	air in residential and technological rooms.	1/7	-
2162019 Design an	Industrial Heating, Ventilation, Airconditioning Ind functional properties of ventilation systems for technological premises. Heat and mass transfer, aerodynamics calculation. Energy c	KZ lemands of syste	4 ms.
2162035	Alternative Energy Sources Principles and basics of alternative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization.	KZ	4
2162064	Noise and Vibration Control Student will be informed about the basic acoustic dimensions, which are important for evaluation of noise.	KZ	4
2162066	Heat Supply	KZ	4
1	g with heat generators in heat-only and combined heat&power mode. Heat generators. Heating networks. Renewable energy so		1 -
2162113	Heating	KZ	4
	Knowledge improvement from the field of heating of residential and industrial buildings. Designing of convective and radiant heating		
2162700	Experimental Methods 1 Introduction study of experimental technique in environmental engineering	KZ	4
2163033	Design IB I.	Z	6
1	ystems, heat distributors and systems for using recoverable source of energy. Design of ventilation and air conditioning systems, includi of noise.	ng gas cleaning a	-
2163034	Project IB II.	Z	6
	oject and experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecologi	ic investment.	
A5M13FVS	Photovoltaic Systems	KZ	4
Solar energy and	d its exploitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (construction ns (including energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and ecolo		
A5M13NZZ	Independent sources	KZ	4
	sources of the electric power - overview. Electrochemical sources (accumulators), applications. Uninteruptible power sources in IB. Ot energy. Perspective sources of electrical enegy, storage of energy.		e electrical
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5
A5M15ES1	Electrical Light 1	KZ	4
A5M16EUE Organization and	Economics of Energy Use energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characterizat sources. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and	KZ tion of aggregate,	-
A5M16FIP		KZ	4
1	Corporate finance	n Z	
Finciples of intance			1 -
comparison time pe	e, present value and alternative cost of capital, financial calculus, long-term finance, valuation of bonds and stocks, investment decisic riod, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance, ca policy.	on and net preser	t value, IRR
	riod, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance, ca policy.	on and net preser ish flow managem	it value, IRR, ient.Dividend
A5M34ELE	riod, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance, ca policy. Electronics	on and net preser sh flow managem KZ	t value, IRR, eent.Dividend
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