Study plan

Name of study plan: Inteligentní budovy - platný od roku 2012

Faculty/Institute/Others: Faculty of Electrical Engineering Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Intelligent Buildings Type of study: Follow-up master full-time Required credits: 116 Elective courses credits: 4 Sum of credits in the plan: 120 Note on the plan:

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 84 The role of the block: P

Code of the group: MIBBME

Name of the group: Safety of the master's studies

Requirement credits in the group:

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

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
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	Р

Characteristics of the courses of this group of Study Plan: Code=MIBBME Name=Safety of the master's studies

 BEZM
 Safety in Electrical Engineering for a master's degree
 Z
 0

 The course provides for students of all programs periodic training guidelines for health and occupational safety and gives knowledge of electrical hazard of given branch of study.
 Students receive indispensable qualification according to the current Directive of the Dean.
 O

Code of the group: MIBDIP1

Name of the group: Diploma Thesis

Requirement credits in the group: In this group you have to gain at least 26 credits (at most 52) Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 26

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
A5M99DIP	Diploma Thesis Petr Kašpar	Z	26	0P+20C	L	Ρ
ADIP26	Diploma Thesis	Z	26	36s	L	Р

Characteristics of the courses of this group of Study Plan: Code=MIBDIP1 Name=Diploma Thesis

A5M99DIP	Diploma Thesis	Z	26		
ADIP26	Diploma Thesis	Z	26		
Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will					
be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.					

Code of the group: MIBP

Name of the group: Compulsory subjects of the programm

Requirement credits in the group: In this group you have to gain 46 credits Requirement courses in the group: In this group you have to complete 11 courses Credits in the group: 46

Note on the gi	loup.					
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
124OSIB	Acoustics and Lighting Jaroslav Vychytil, Lenka Maierová Jaroslav Vychytil Jaroslav Vychytil (Gar.)	KZ	4	2P	Z	Ρ
125ESB	Buildings Ecology Systems Stanislav Frolík Stanislav Frolík (Gar.)	KZ	4	2P	L	Ρ
125EABI	Energy Audit of Building Hana Kabrhelová	KZ	4	2P	L	Ρ
124KPKP	Building Structures Ctislav Fiala Ctislav Fiala Ctislav Fiala (Gar.)	ZK	4	3P	Z	Ρ
2161108	Transport Phenomena Martin Barták Martin Barták Martin Barták (Gar.)	Z,ZK	4	2P+1C	*	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
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
2161102	Radiant and Industrial Heating Jií Bašta, Roman Vav i ka Jií Bašta Jií 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
124ST1	Thermal Engineering in Construction Jan Tywoniak Jan Tywoniak Jan Tywoniak (Gar.)	ZK	5	2P	Z	Ρ
2161567	Ventilation and Air Conditioning Vladimír Zmrhal, Petr Zelenský Vladimír Zmrhal Vladimír Zmrhal (Gar.)	Z,ZK	4	2P+1C	2	Ρ

Characteristics of the courses of this group of Study Plan: Code=MIBP Name=Compulsory subjects of the programm

124OSIB	Acoustics and Lighting	KZ	4			
The course introduces	students to the basics of building lighting technology and building acoustics and deepens further knowledge.					
125ESB	Buildings Ecology Systems	KZ	4			
Principles of environme	ntally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, syste	m design, pumpin	ıg devices, water			
saving and special insta	allations.					
125EABI	Energy Audit of Building	KZ	4			
Advanced course for int	roduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy production into energy performance of buildings, legislation.	erformance direc	tive for buildings.			
Methodology of calculat	ting energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial condi	tion, description c	of initial condition			
	ey of project documentation. Determining source efficiency, distribution and emission of heat. Steps towards reduction of energ					
	ems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical eval					
	on. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is	s focused on the r	ealistic buildings			
	case study report about energy audit of existing building.					
124KPKP	Building Structures	ZK	4			
Basics of building struct	ures. Functional requirements, structural systems, spatial effect of the structural system. Vertical load-bearing structures, floor s	tructures, overha	nging structures.			
	windows, partitions, floors, suspended ceilings. Stairs, roof construction timber roof trusses, roof envelopes. Foundation structure	ctures, structural s	solution of the			
substructure, waterproc	fing of the substructure. Structural systems of single and multi-storey buildings, structural systems of long-span structures.					
2161108	Transport Phenomena	Z,ZK	4			
Basics of transport phe	nomena for the study programme Intelligent Buildings. Momentum, heat and mass transport in built environment.					
2161109	Automatic control in environmental engineering of building	Z,ZK	4			
Application of basic app	proaches to automatic control of HVAC systems and equipments. Automatic control sequences of air conditioning and source	s of heat.				
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5			
2161102	Radiant and Industrial Heating	Z,ZK	4			
Student will be informed	a about the basics of radiant and other industrial heating systems					
A5M38SZS	Sensors and Networks	Z,ZK	4			
Applications of sensors	in buildings					
124ST1	Thermal Engineering in Construction	ZK	5			
The subject discusses t	he basic chapters of building physics - part hygrothermal performance of buildings in an overview manner with the aim of prov	ding basic inform	ation to students			
coming from non-construction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming from civil engineering.						
2161567	Ventilation and Air Conditioning	Z,ZK	4			
Main knowledge for des	sign, control and evaluation of ventilation and air conditioning systems. Design according to demands for treatment of thermal	and humidity sta	te and quality of			
air in residential and teo	chnological rooms.					

Code of the group: MIBPRO1 Name of the group: Project 1 Requirement credits in the group: In this group you have to gain 6 credits Requirement courses in the group: In this group you have to complete 1 course Credits in the group: 6 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2163033	Design IB I. Martin Barták, Ji í Bašta, Jind ich Bohá , Roman Vav i ka, Vladimír Zmrhal, Petr Zelenský, Ji í Hemerka, Miroslav Ku era, Miloš Lain, Ji í Bašta Ji í Bašta (Gar.)	Z	6	0P+4C	*	Ρ
125PIB1	Project 1 Stanislav Frolík, Zuzana Veverková, Ilona Koubková, Michal Kabrhel, Karel Kabele, Bohumír Garlík, Daniel Adamovský, Miroslav Urban, Pavla Hofbauer Pechová, Stanislav Frolík Michal Kabrhel (Gar.)	Z	6	4C	L	Ρ
A5M99PR1	Project 1 Petr Kašpar Petr Kašpar (Gar.)	Z	6	0P+4C	L	Р

Characteristics of the courses of this group of Study Plan: Code=MIBPRO1 Name=Project 1

2100000	D colgin ib ii		U U				
Design of heating systems, heat distributors and systems for using recoverable source of energy. Design of ventilation and air conditioning systems, including gas cleaning and reduction							
of noise.							
125PIB1	Project 1	Z	6				

6

Project 1 is the subject of the interfaculty course Intelligent Buildings. Its content is focused on the issue of intelligent buildings in order to link the knowledge from the Bachelor's degree to other disciplines. In the project, the student demonstrates the ability to independently develop a project in the field of intelligent buildings using a thorough analysis of the current state of the art from the literature. Ζ 6

A5M99PR1 Project 1

The topic of the thesis is chosen by the student and selected from the list of topics. "Project 1" is followed by "Project 2" with a higher difficulty. The assignment of the project is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented.

Code of the group: MIBPRO2

Name of the group: Project 2

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

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

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2163034	Project IB II. Ji i Bašta Ji i Bašta (Gar.)	Z	6	0P+4C	*	Ρ
125PIB2	Project 2 Michal Kabrhel Michal Kabrhel (Gar.)	Z	6	4C	Z	Ρ
A5M99PR2	Project 2 Petr Kašpar Petr Kašpar (Gar.)	Z	6	0P+4C	Z	Р

Characteristics of the courses of this group of Study Plan: Code=MIBPRO2 Name=Project 2

2163034	Project IB II.	Z	6			
Project and experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecologic investment.						
125PIB2	Project 2	Z	6			
Project 2 is the subject	of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop	a more advanced	l project in the			
field of intelligent buildings.						
A5M99PR2	Project 2	Z	6			
The topic of the thesis is chosen by the student and selected from the list of topics. Project 2 mostly follows the topic of "Project 1" with a higher difficulty. The assignment of the project						
is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented.						

Name of the block: Compulsory elective courses Minimal number of credits of the block: 32 The role of the block: PV

Code of the group: MIBPVP

Name of the group: Compulsory optionally subjects

Requirement credits in the group: In this group you have to gain at least 32 credits (at most 116) Requirement courses in the group: In this group you have to complete at least 8 courses (at most 29) Credits in the group: 32

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
A5M02AKA	Acoustic Applications Ond ej Ji í ek Ond ej Ji í ek Ond ej Ji í ek (Gar.)	KZ	4	2P+2L	L	PV
2162035	Alternative Energy Sources Tomáš Matuška Tomáš Matuška (Gar.)	KZ	4	2P+1C	*	PV
A5M17BUP	Biological Effects of Electromagnetic Field Jan Vrba, Ladislav Oppl Jan Vrba Jan Vrba (Gar.)	KZ	4	2P+2L	L	PV
2152060	Refrigeration Technique and Heat Pumps for Intelligent Buildings	KZ	4	3P+1C	*	PV
A5M16EUE	Economics of Energy Use Ji í Beranovský, Július Bemš Ji í Beranovský Július Bemš (Gar.)	KZ	4	3P+1C	Z	PV
A5M15ES1	Electrical Light 1 Petr Žák, Petr Žák Petr Žák (Gar.)	KZ	4	2P+1S	Z	PV
A5M38BEM	Electromagnetic compatibility	KZ	4	1P+1L	Z	PV
A5M34EZS	Electronic security systems Miroslav Husák, Jan Novák, Tomáš Teplý, Václav Prajzler Václav Prajzler Václav Prajzler (Gar.)	KZ	4	3P+1L	Z	PV
A5M34ELE	Electronics Alexandr Laposa, Adam Bou a Alexandr Laposa Alexandr Laposa (Gar.)	KZ	4	3P+1L	L	PV
2162700	Experimental Methods 1 Miroslav Ku era Miroslav Ku era (Gar.)	KZ	4	0P+4L	*	PV
A5M16FIP	Corporate finance Old ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý (Gar.)	KZ	4	3P+1C	L	PV
A5M13FVS	Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.)	KZ	4	2P+2L	L	PV
A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4	2P+1C	L	PV
124INBB	Integrated Design of Buildings Jan R ži ka, Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.)	Z,ZK	4	2P+1C	Z	PV
A5M38MEB	Measurements in the Buildings Petr Kašpar Petr Kašpar (Gar.)	KZ	4	2P+1L	Z	PV
A5M35MAS	Modeling and simulation	KZ	4	2P+2C	Z	PV
125MEC	Simulation of Building Energy Performance Karel Kabele, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	KZ	4	1P+1C	Z	PV
A5M13NZZ	Independent sources Pavel Hrzina, Václav Papež Pavel Hrzina Pavel Hrzina (Gar.)	KZ	4	3P+1L	Z	PV
125OZEB	Renewable Energy Sources Michal Kabrhel Michal Kabrhel (Gar.)	ZK	4	2P	Z	PV
125PBZB	Fire Services Ilona Koubková, Bohumír Garlík, Daniel Adamovský, Pavla Hofbauer Pechová Ilona Koubková Ilona Koubková (Gar.)	КZ	4	2P	L	PV
A5M38SPD	Collection and data transfer Pavel Mlejnek	KZ	4	3P+1L	L	PV
2162064	Noise and Vibration Control Miroslav Ku era, Richard Nový Miroslav Ku era Miroslav Ku era (Gar.)	KZ	4	2P+1C	*	PV
125SYB	Building Systems Jan Tywoniak, Karel Kabele Karel Kabele Karel Kabele (Gar.)	ZK	4	4P	Z	PV
125TECE	Technological Units Ilona Koubková, Hana Kabrhelová Ilona Koubková Ilona Koubková (Gar.)	KZ	4	2P	Z	PV
B5M99SCT	Technology for Smart Cities Lukáš Ferkl Lukáš Ferkl Lukáš Ferkl (Gar.)	Z,ZK	4	2P+1C	Z	PV
A5M14ZSE	Fundamentals of Power Electrical Engineering	KZ	4	2+1L	L	PV
2152038	Energy Sources and Conversions	KZ	4	3P+1C	*	PV
A5M02AKA A	e courses of this group of Study Plan: Code=MIBPVP Name=Co coustic Applications tions in physical acoustics, room and building acoustics, environmental acoustics, nois				KZ	4 tics, and
	ternative Energy Sources ernative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilizatior	۱.			KZ	4
A5M17BUP Biophysical Aspects of Electer Experimental Results and I	ological Effects of Electromagnetic Field tromagnetic Fields (EF) coupling of Various Biological Systems (BS). Interaction of EF Hypotheses of Biological Effects of Static and Stationary Electrical, Magnetic and Nons tions of EF in Medicine. Hygienic Standards.	with BS - overview		m of Interac		-

by living Organism. Applications of EF in Medicine. Hygienic Standards.						
2152060	Refrigeration Technique and Heat Pumps for Intelligent Buildings	KZ	4			
A5M16EUE	Economics of Energy Use	KZ	4			
Organization and energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characterization of aggregate, secondary						
energy sources. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial analysis.						
A5M15ES1	Electrical Light 1	KZ	4			

A5M38BEM	Electromagnetic compatibility	KZ	4
A5M34EZS	Electronic security systems	KZ	4
A5M34ELE	Electronics	KZ	-
			4
2162700	Experimental Methods 1	KZ	4
	perimental technique in environmental engineering	1/7	4
A5M16FIP	Corporate finance	KZ	4
	esent value and alternative cost of capital, financial calculus, long-term finance, valuation of bonds and stocks, investment de	-	
policy.	annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance	e, casir now manaç	gement.Dividend
A5M13FVS	Photovoltaic Systems	KZ	4
	ploitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (construct		-
, a,	including energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and e	0, 1	,
A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4
	e student with a necessary overview of information technologies with attention paid to regiremnts of intelligent building inform	· · ·	-
	methods and techniques applicable to knowledge based systems aimed at automated solving of decision-making problems.	-	
	presentation and its modeling so that the students are able to communicate effectively with IT and knowledge engineering exp	-	-
	g protocols used in intelligent buildings.		
124INBB	Integrated Design of Buildings	Z,ZK	4
	e subject Integrated Building Design is to get an complex overview of the principles of integrated buildings design, life cycle as	· ·	dings, evaluation
of building performance	, green/sustainable certification systems and understand environmental, social and economic aspects of the built environment	nt.	
A5M38MEB	Measurements in the Buildings	KZ	4
The students will learn a	about principles of measurement of basic physical quantities in the building. As the majority of the physical quantities are con	verted to the elec	trical signals, an
overview of measureme	ent of the electrical quantities is also presented. The subject is not intended for students who have already studied the subject	ts Electrical meas	urement and
Sensors and transducer	rs on CTU FEE.		
A5M35MAS	Modeling and simulation	KZ	4
125MEC	Simulation of Building Energy Performance	KZ	4
	explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview		-
	and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, cons		-
-	aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating building e		
A5M13NZZ	Independent sources	KZ	4
	s of the electric power - overview. Electrochemical sources (accumulators), applications. Uninteruptible power sources in IB. (Other sources of t	he electrical
	rces of electrical enegy, storage of energy.		
125OZEB	Renewable Energy Sources	ZK	4
	enewable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal and h	-	
	ergies and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design	facilities and syste	ems that use
renewable energy source	Fire Services	KZ	4
-	ms,fire pipe,fire station.Fixed fire-fighting water with water mist, foam, and halon. Special fire-fighting equipment.Protecting b		-
	t.Electric fire alarm. Fire control equipment. Backup power source.	ululings against i	ne spread nom
A5M38SPD	Collection and data transfer	KZ	4
2162064	Noise and Vibration Control	KZ	4
	about the basic acoustic dimensions, which are important for evaluation of noise.	ΝZ.	4
125SYB		ZK	4
	Building Systems the requirements for the indoor environment and the function of the systems in different types of buildings and plants and op		
-	uilding systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions		-
	puilding design. E.g. office buildings, residential buildings, halls, shopping centres, cultural centres, industrial buildings, sports		
	e introduced to the requirements for the indoor environment, the characteristic elements of energy and environmental building s		
design for the building ty	ype.		
125TECE	Technological Units	KZ	4
Saunas, fireplaces, kitcl	nen technology, elevators, heat pumps, technology, swimming pools, heat source and technological systems.		
B5M99SCT	Technology for Smart Cities	Z,ZK	4
A5M14ZSE	Fundamentals of Power Electrical Engineering	KZ	4
2152038	Energy Sources and Conversions	KZ	4

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

Code of the group: MIBVOLPRE Name of the group: Elective subjects Requirement credits in the group: Requirement courses in the group: Credits in the group: 0 Note on the group: ~Nabídku volitelných předmětů uspořádaných podle kateder najdete na webových stránkách http://www.fel.cvut.cz/cz/education/volitelne-predmety.html\\

List of courses of this pass:

	Name of the course	Completion	Credits
124INBB	Integrated Design of Buildings	Z,ZK	4
	of the subject Integrated Building Design is to get an complex overview of the principles of integrated buildings design, life cycle asses	-	, evaluation
	uilding performance, green/sustainable certification systems and understand environmental, social and economic aspects of the built		4
124KPKP Basics of building si	Building Structures ructures. Functional requirements, structural systems, spatial effect of the structural system. Vertical load-bearing structures, floor struc	ZK turos overbandin	4
-	ings, windows, partitions, floors, suspended ceilings. Stairs, roof construction timber roof trusses, roof envelopes. Foundation structu		-
	ubstructure, waterproofing of the substructure. Structural systems of single and multi-storey buildings, structural systems of long-spar		
124OSIB	Acoustics and Lighting	KZ	4
I	The course introduces students to the basics of building lighting technology and building acoustics and deepens further knowle	edge.	
124ST1	Thermal Engineering in Construction	ZK	5
-	es the basic chapters of building physics - part hygrothermal performance of buildings in an overview manner with the aim of providing	-	
-	n non-construction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming f		-
125EABI	Energy Audit of Building	KZ	4 or buildingo
	r introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy perfo culating energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial condition		-
0,	urvey of project documentation. Determining source efficiency, distribution and emission of heat. Steps towards reduction of energy co		
	systems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluati		
of environment prot	ection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is for	cused on the realis	tic buildings
	resulting to presenting case study report about energy audit of existing building.		
125ESB	Buildings Ecology Systems	KZ	4
Principles of enviro	mentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system de	esign, pumping de	vices, water
125MEC	saving and special installations.	KZ	4
	Simulation of Building Energy Performance dat explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview or		4 Iologies for
	erns and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, construct		-
	naviour. The aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating build		
125OZEB	Renewable Energy Sources	ZK	4
The course deals v	vith renewable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal and hydr	o-are discussed ir	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 factorial and the correct way to desi	cilities and system	s that use
	renewable energy sources.		
125PBZB	Fire Services	KZ	4
Fire water,nydrant	systems, fire pipe, fire station. Fixed fire-fighting water with water mist, foam, and halon. Special fire-fighting equipment. Protecting build technological equipment. Electric fire alarm. Fire control equipment. Backup power source.	lings against fire s	pread from
125PIB1	Project 1	7	6
-	ect of the interfaculty course Intelligent Buildings. Its content is focused on the issue of intelligent buildings in order to link the knowled	—	-
-	s. In the project, the student demonstrates the ability to independently develop a project in the field of intelligent buildings using a tho	-	-
	state of the art from the literature.		
125PIB2	Droin at 2		
Project 2 is the su	Project 2	Z	6
	pject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a		_
	pject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings.	more advanced pr	oject in the
125SYB	oject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings. Building Systems	more advanced pr	oject in the
125SYB Multi-criteria analys	oject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings. Building Systems is of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optimize	more advanced pr ZK zation criteria for tl	oject in the 4 ne design of
125SYB Multi-criteria analys energy and ecologi	oject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings. Building Systems	nore advanced pr ZK zation criteria for th ifferent building ty	oject in the 4 ne design of bes in terms
125SYB Multi-criteria analys energy and ecologi of indoor systems a	oject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings. Building Systems is of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optimizat building systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions in d	nore advanced pr ZK zation criteria for th ifferent building ty Idings, family hous	oject in the 4 ne design of bes in terms ses, passive
125SYB Multi-criteria analys energy and ecologi of indoor systems a	bject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings. Building Systems is of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optimiz cal building systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions in d ind building design. E.g. office buildings, residential buildings, halls, shopping centres, cultural centres, industrial buildings system ill be introduced to the requirements for the indoor environment, the characteristic elements of energy and environmental building system design for the building type.	nore advanced pr ZK zation criteria for th ifferent building ty Idings, family hous	oject in the 4 ne design of bes in terms ses, passive
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2162700	Experimental Methods 1	KZ	4
2163033	Introduction study of experimental technique in environmental engineering Design IB I.	Z	6
	heat distributors and systems for using recoverable source of energy. Design of ventilation and air conditioning systems, inc		-
0 0,	of noise.	00 0	
2163034	Project IB II.	Z	6
	d experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of eco	ologic investment.	
A5M02AKA	Acoustic Applications	KZ	4
Lecture summarize appli	cations in physical acoustics, room and building acoustics, environmental acoustics, noise and vibration control, physiolog ultrasound.	gical acoustics, diagno	ostics, and
A5M13FVS	Photovoltaic Systems	KZ	4
	loitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (constru		-
	iding energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and e		
A5M13NZZ	Independent sources	KZ	
Electrochemical sources	of the electric power - overview. Electrochemical sources (accumulators), applications. Uninteruptible power sources in IB energy. Perspective sources of electrical enegy, storage of energy.	S. Other sources of the	electrical
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5
A5M14ZSE	Fundamentals of Power Electrical Engineering	KZ	4
A5M142SE A5M15ES1		KZ KZ	4
	Electrical Light 1 Economics of Energy Use	KZ	4
A5M16EUE	ECONOMICS OF Energy USE management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characte	1	
	s. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy a		secondary
A5M16FIP	Corporate finance	KZ	4
	ent value and alternative cost of capital, financial calculus, long-term finance, valuation of bonds and stocks, investment de		-
	nual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance	-	
	policy.		
A5M17BUP	Biological Effects of Electromagnetic Field	KZ	4
	ctromagnetic Fields (EF) coupling of Various Biological Systems (BS). Interaction of EF with BS - overview. Mechanism of		-
Experimental Results and	Hypotheses of Biological Effects of Static and Stationary Electrical, Magnetic and Nonstationary Fields. Mathematical Sol	ution of Interaction E	F generated
	by living Organism. Applications of EF in Medicine. Hygienic Standards.		-
A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4
The course provides the	Information and Knowledge-Based Systems student with a necessary overview of information technologies with attention paid to reqiremnts of intelligent building infor	Z,ZK mation systems. Furt	4 her on, the
The course provides the student learns the basic n	Information and Knowledge-Based Systems student with a necessary overview of information technologies with attention paid to reqiremnts of intelligent building infor nethods and techniques applicable to knowledge based systems aimed at automated solving of decision-making problems	Z,ZK mation systems. Furt s. The attention is paid	4 her on, the d namely to
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The course provides the student learns the basic n data and knowledge repre A5M34ELE A5M34EZS A5M35MAS A5M38BEM	Information and Knowledge-Based Systems student with a necessary overview of information technologies with attention paid to regiremnts of intelligent building infor nethods and techniques applicable to knowledge based systems aimed at automated solving of decision-making problems sentation and its modeling so that the students are able to communicate effectively with IT and knowledge engineering ex- the basics of networking protocols used in intelligent buildings. Electronics Electronic security systems Modeling and simulation Electromagnetic compatibility	Z,ZK mation systems. Furt s. The attention is paid perts. The students w KZ KZ KZ KZ	4 her on, the d namely to ill also learn 4 4 4 4
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