Study plan

Name of study plan: Inteligentní budovy - platný od roku 2020

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: 120 Elective courses credits: 0 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: 88 The role of the block: P

Code of the group: 2020_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 aroup:

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

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Characteristics of the courses of this group of Study Plan: Code=2020_MIBBME Name=Safety of the master's studies

BF7M Safety in Electrical Engineering for a master's degree 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.

Code of the group: 2020_MIBDIP

Name of the group: Diploma Thesis

Requirement credits in the group: In this group you have to gain 26 credits

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

Credits in the group: 26

Note on the aroup:

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

Characteristics of the courses of this group of Study Plan: Code=2020_MIBDIP Name=Diploma Thesis

ADIP26 **Diploma** Thesis

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: 2020_MIBP

Name of the group: Compulsory subjects of the programm

Requirement credits in the group: In this group you have to gain 50 credits

Requirement courses in the group: In this group you have to complete 12 courses

Credits in the group: 50

Note on the grou	אף. 					
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.)	КZ	4	2P	L	Ρ
125EABU	Energy Audit of Building Karel Kabele, Miroslav Urban, Michal Kabrhel Karel Kabele Karel Kabele (Gar.)	КZ	4	2P+1C	L	Ρ
124KPKP	Building Structures - Final Review Ctislav Fiala Ctislav Fiala Ctislav Fiala (Gar.)	ZK	4	3P	Z	Р
124OSIB	Lighting and Acoustics Jaroslav Vychytil, Lenka Maierová Jaroslav Vychytil Jaroslav Vychytil (Gar.)	KZ	4	2P	Z	Р
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	*	Р
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	Р
2161102	Radiant and Industrial Heating 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
124ST1	Thermal Engineering in Construction 1 Jan Tywoniak Jan Tywoniak Jan Tywoniak (Gar.)	ZK	5	2P	Z	Р
B5M99SCT	Technology for Smart Cities Lukáš Ferkl Lukáš Ferkl Lukáš Ferkl (Gar.)	Z,ZK	4	2P+1C	Z	Р
2161567	Ventilation and Air Conditioning Vladimír Zmrhal, Miloš Lain Vladimír Zmrhal Vladimír Zmrhal (Gar.)	Z,ZK	4	2P+1C	2	Р

Characteristics of the courses of this group of Study Plan: Code=2020_MIBP Name=Compulsory subjects of the programm

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	g devices, water
saving and special insta	allations.		
125EABU	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 performance of buildings, legislation.	performance direct	tive for buildings.
	ing energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial cond	· ·	
	y of project documentation. Determining source efficiency, distribution and emission of heat. Steps towards reduction of energy		U . U .
	ems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical eva		
	on. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar i	s focused on the r	ealistic buildings
	case study report about energy audit of existing building.	11	
124KPKP	Building Structures - Final Review	ZK	4
, v	ures. Functional requirements, structural systems, spatial effect of the structural system. Vertical load-bearing structures, floor s		
	windows, partitions, floors, suspended ceilings. Stairs, roof construction - timber roof trusses, roof envelopes. Foundation st	ructures, structura	I solution of the
	fing of the substructure. Structural systems of single and multi-storey buildings, structural systems of long-span structures.		
124OSIB	Lighting and Acoustics	KZ	4
	students to the basics of building lighting technology and building acoustics and deepens further knowledge.	1 î	
2161108	Transport Phenomena	Z,ZK	4
	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 1	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	iding basic inform	ation to students
coming from non-consti	ruction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming from	civil engineering.	
B5M99SCT	Technology for Smart Cities	Z,ZK	4
2161567	Ventilation and Air Conditioning	Z,ZK	4
Main knowledge for des	ign, control and evaluation of ventilation and air conditioning systems. Design according to demands for treatment of therma	I and humidity sta	te and quality of
air in residential and teo	chnological rooms.		

Code of the group: 2020_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 , Vladimír Zmrhal, Miloš Lain, Ji í Hemerka, Miroslav Ku era, Tomáš Matuška, Roman Vav i ka, Ji í Bašta Ji í Bašta (Gar.)	Z	6	0P+4C	*	Ρ
125PIB1	Project 1 Stanislav Frolík, Karel Kabele, Miroslav Urban, Michal Kabrhel, Zuzana Veverková, Ilona Koubková, Bohumír Garlík, Daniel Adamovský, 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=2020_MIBPRO1 Name=Project 1

2163033 Design IB I.

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.

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125PIB1 Project 1

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.

 A5M99PR1
 Project 1
 Z
 6

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: 2020_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 í Bašta Ji í 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=2020_MIBPRO2 Name=Project 2

2163034	Project IB II.	Z	6
Project and experiment	al solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecologic investmen	t.	
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 advance	d project in the
field of intelligent buildir	igs.		
A5M99PR2	Project 2	Z	6
The topic of the thesis is	s chosen by the student and selected from the list of topics. Project 2 mostly follows the topic of "Project 1" with a higher diffic	ulty. The assignm	ent of the project
is subject to the approv	al 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: 2020_MIBPV 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 92) Requirement courses in the group: In this group you have to complete at least 8 courses (at most 23) Credits in the group: 32 Note on the group:

2162035A To2151154R AA5M16EUEF J AA5M15ES1F B AA5M34EZSF M GA5M34ELEF A125EIBBF B C O2162700F AA5M16FIPC O G GA5M13FVSP B A124INBBIn P A125MECSi AA5M13NZZIn P A125OZEBFi IO C A125PBZBFi IO C A125SYBFi C A125SYBFi C C A125SYBFi C C A125SYBFi C C A1262066H To To C C A2162035Altern Principles and basics of alternation To To The subject is an introduction to	Tutors, authors and guarantors (gar.) Alternative Energy Sources Tomáš Matuška Tomáš Matuška Tomáš Matuška (Gar.) Refrigertion and heat pumps Economics of Energy Use Ii í Beranovský Ji í Beranovský (Gar.) Electrical Light 1 Petr Žák, Petr Zák Electronic security systems Miroslav Husák, Jan Novák, Tomáš Teplý Miroslav Husák Miroslav Husák Gar.) Electronics Alexandr Laposa Alexandr Laposa Alexandr Laposa (Gar.) Electroengineering and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.) Experimental Methods 1 Miroslav Ku era Miroslav Ku era Miroslav Ku era (Gar.) Corporate finance Did ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) Measurements in the Buildings Patr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance Karel Kabele, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	KZ KZ KZ KZ KZ	4 4 4 4 4 4 4 4 4 4	2P+1C 3P+1C 3P+1C 2P+1S 3P+1L 3P+1L 2P 0P+4L	× Z Z Z L Z	PV PV PV PV PV PV
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A5M15ES1Fi PaA5M34EZSEI Mi (GA5M34ELEEI Mi (G125EIBBEI C2162700E2 MiA5M16FIPCI (GA5M13FVSPI Pa Mi124INBBIn Pa MiA5M38MEBMa Pa Mi125MECSi Ka A5M13NZZA5M13NZZIn Pa Mi125OZEBFi Mi Mi125PBZBFi Mi Mi A5M38SBD2162019In Mi Mi A5M38SBD2162064Mi Mi Mi D2162066Ha To To C2162035Altern Principles and basics of alternati 21511542151154Refrig The subject is an introduction to	Electrical Light 1 Petr Žák, Petr Žák Electronic security systems Miroslav Husák, Jan Novák, Tomáš Teplý Miroslav Husák Miroslav Husák Gar.) Electronics Alexandr Laposa Alexandr Laposa Alexandr Laposa (Gar.) Electroengineering and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.) Experimental Methods 1 Miroslav Ku era Miroslav Ku era Miroslav Ku era (Gar.) Corporate finance Did ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý 'Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	KZ KZ KZ KZ KZ KZ	4 4 4 4 4	3P+1L 3P+1L 2P	Z	PV PV
A5M34EZS FI A5M34ELE FI 125EIBB FI 2162700 FI A5M16FIP Co A5M13FVS Pa A5M38MEB Ma 124INBB Ma A5M38MEB Ma A5M38MEB Ma 124INBB Ma A5M38MEB Ma 125MEC Si A5M13NZZ In 125OZEB Fi 125PBZB Fi 2162019 Ma A5M38SBD Ca 2162064 Ma 125SYB Fi 2162066 Ha 2162066 Ha 2162035 Altern Principles and basics of alternati 2151154 Principles and basics of alternati Ta 2151154 Refrig The subject is an introduction to Ta	Electronic security systems Miroslav Husák, Jan Novák, Tomáš Teplý Miroslav Husák Miroslav Husák Gar.) Electronics Alexandr Laposa Alexandr Laposa Alexandr Laposa (Gar.) Electroengineering and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.) Experimental Methods 1 Miroslav Ku era Miroslav Ku era Miroslav Ku era (Gar.) Corporate finance Did ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý 'Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	KZ KZ KZ KZ KZ	4 4 4 4	3P+1L 2P	L	PV
ASM/34ELE AM 125EIBB EI 2162700 EX A5M16FIP CG A5M13FVS PI A5M13FVS PI A5M38MEB M 124INBB In A5M38MEB M 125MEC Si A5M13NZZ In 125OZEB Fi 125PBZB Fi 2162019 M A5M38SBD Ca 2162064 M 125TECE Ta 2162064 M 125TECE Ta 2162066 Ha 2162063 Altern 2162035 Altern 2151154 Refrig Principles and basics of alternati 2151154	Alexandr Laposa Alexandr Laposa Alexandr Laposa (Gar.) Electroengineering and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.) Experimental Methods 1 Miroslav Ku era Miroslav Ku era Miroslav Ku era (Gar.) Corporate finance Did ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý 'Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	KZ KZ KZ KZ	4	2P	_	
125EIBB Eigen and a second	Electroengineering and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.) Experimental Methods 1 Miroslav Ku era Miroslav Ku era Miroslav Ku era (Gar.) Corporate finance Old ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý (Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	KZ KZ KZ	4		Z	
2162700 Example A5M16FIP Construction A5M13FVS Plants A5M13FVS Plants A5M38MEB Mention A5M38MEB Mention 125MEC Siate A5M13NZZ Integer 125OZEB Ref 125PBZB Integer 2162019 Integer 2162064 Nents 125SYB Fill 125TECE Teger 2162064 Ments 12162066 Hents 2162035 Altern Principles and basics of alternati 2151154 Participant Refrig The subject is an introduction to Teger	Experimental Methods 1 Miroslav Ku era Miroslav Ku era Miroslav Ku era (Gar.) Corporate finance Did ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	KZ		0P+4L	1 1	PV
A5M16FIP A5M13FVS A5M13FVS A5M13FVS A5M38MEB A5M38MEB A5M38MEB A5M38MEB A5M13NZZ A5M13NZZ A5M13NZZ I25OZEB A5M13NZZ I25OZEB I25PBZB I2	Corporate finance Old ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý (Gar.) Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	KZ	4		*	PV
A5M13FVS Pa 124INBB In A5M38MEB Ma A5M38MEB Ma 125MEC Si A5M13NZZ In A5M13NZZ In 125OZEB Ri 125PBZB Fi 2162019 In A5M38SBD Cr 2162064 Na 125YB Bi 2162064 Na 125TECE Te 2162066 Ha Ji 2162035 Altern Pa 2162035 Altern Principles and basics of alternati 2151154 Refrig The subject is an introduction to	Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.) ntegrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance			3P+1C	L	PV
A5M38MEB M A5M38MEB M 125MEC Si A5M13NZZ In 125OZEB R 125PBZB Fi 2162019 In A5M38SBD C 2162064 N 125YB E 2162064 N 125YB E 2162064 N 125YB B 2162064 N 2162066 H 2162035 Altern Principles and basics of alternati 2151154 2151154 Refrig The subject is an introduction to To	Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.) Measurements in the Buildings Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance		4	2P+2L	Z	PV
Pee 125MEC Si A5M13NZZ In 125OZEB Ri 125PBZB Fi 125PBZB Fi 2162019 In A5M38SBD Call 2162064 Mill 125TECE Te 2162066 He 2162066 He 2162035 Altern Principles and basics of alternati 2151154 Refrig The subject is an introduction to	Petr Kašpar Petr Kašpar Petr Kašpar (Gar.) Simulation of Building Energy Performance	Z,ZK	4	2P+1C	Z	PV
A5M13NZZ In A5M13NZZ In 125OZEB R 125PBZB F 125PBZB In 125PBZB In 125PBZB In 125PBZB In 125PBZB In 125PBZB In 125CE In 125SYB In 125SYB In 125TECE IN 125T	Simulation of Building Energy Performance Karel Kabele, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	KZ	4	2P+1L	Z	PV
ASW131422 Vá 1250ZEB Rí 125PBZB Io 125PBZB Io 2162019 In A5M38SBD Ca 2162064 Na 125YB Ba 2162064 Na 125SYB Ba 125TECE Te 2162066 Ha 2162066 Ha 2162035 Altern Principles and basics of alternati 2151154 Refrig The subject is an introduction to		KZ	4	1P+1C	Z	PV
125OZEBR Mil125PBZBII III IIII IIII IIII IIII IIIIIIIII IIIIIIIIIIIIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	ndependent sources Václav Papež Václav Papež (Gar.)	KZ	4	3P+1L	Z	PV
125PBZBFi Ilo Ilo2162019In VkA5M38SBDCi Pa2162064No Mit125SYBBi Ka125TECETe Ilo2162113Hi Ji2162066Hi ToCharacteristics of the co 2162035Altern Altern Principles and basics of alternati 21511542151154Refrig The subject is an introduction to	Renewable Energy Sources Michal Kabrhel, Hana Kabrhelová Michal Kabrhel Michal Kabrhel (Gar.)	ZK	4	2P	L	PV
2162013 Vik A5M38SBD Ci 2162064 No 125SYB Bi 125TECE Te 2162066 Hi 2162066 Hi 2162035 Altern Principles and basics of alternati 2151154 Refrig The subject is an introduction to	Fire Services lona Koubková, Bohumír Garlík, Pavla Hofbauer Pechová Ilona Koubková lona Koubková (Gar.)	KZ	4	2P	L	PV
A5M38SBDC.2162064No125SYBBi125TECETe2162113He2162066HeCharacteristics of the co2162035AlternPrinciples and basics of alternati2151154RefrigThe subject is an introduction to	ndustrial Heating, Ventilation, Airconditioning Vladimír Zmrhal, Miloš Lain Vladimír Zmrhal Vladimír Zmrhal (Gar.)	KZ	4	2P+1C	2	PV
2162064Ni Mi125SYBBi Ka125TECETe Ilo2162113He Ji2162066He ToCharacteristics of the co 2162035Altern Altern Principles and basics of alternati 21511542151154Refrig The subject is an introduction to	Collection and Data Transfer Pavel Miejnek Pavel Miejnek Ji í Novák (Gar.)	KZ	4	2P+1L	L	PV
125SYBBrain Kate125TECETerm Ilo2162113Herm Ji2162066Herm ToCharacteristics of the co 2162035Altern Altern Principles and basics of alternati 21511542151154Refrig The subject is an introduction to	Noise and Vibration Control Miroslav Ku era, Richard Nový Miroslav Ku era Miroslav Ku era (Gar.)	KZ	4	2P+1C	*	PV
125TECETe lo2162113He Ji2162066He ToCharacteristics of the co 21620352162035Altern Principles and basics of alternati 21511542151154Refrig The subject is an introduction to	Building Systems Karel Kabele, Jan Tywoniak Karel Kabele Karel Kabele (Gar.)	ZK	4	4P	Z	PV
2162113Hi Ji2162066Hi ToCharacteristics of the co 21620352162035Altern Principles and basics of alternati 21511542151154Refrig The subject is an introduction to	Fechnological Units Iona Koubková Ilona Koubková Ilona Koubková (Gar.)	KZ	4	2P	Z	PV
2162066Hi ToCharacteristics of the co2162035AlternPrinciples and basics of alternati2151154RefrigThe subject is an introduction to	Heating	KZ	4	2P+2C	1	PV
Characteristics of the co 2162035 Altern Principles and basics of alternati 2151154 Refrig The subject is an introduction to	li í Bašta, Jind ich Bohá , Roman Vav i ka Ji í Bašta Ji í Bašta (Gar.) Heat Supply Tomáš Matuška Tomáš Matuška Tomáš Matuška (Gar.)	КZ	4	2P+1C	3	PV
2162035AlternPrinciples and basics of alternati2151154RefrigThe subject is an introduction to					ia ete	
Principles and basics of alternation 2151154 Refrig The subject is an introduction to	courses of this group of Study Plan: Code=2020_MIBPV Nan native Energy Sources	ie=compuiso	y option		KZ	4
The subject is an introduction to	ative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization	n.		I		
	gertion and heat pumps o the refrigeration technology and the heat pumps with the following thematic area	s: • Fundamentals	of thermody	1	KZ	4
	ic form, basic processes. • Converting of unit's parameters to other working conditi		-			-
	cycles. • Refrigerants: classification, nomenclature, legislation. • Sorption cycles: classification, nomenclature, legislation.	assification, thermo				
	asic form, basic processes. • Heat pumps: heating and hot tap water. • Heat source	s for HP				
	nomics of Energy Use		·		KZ	4
	gement of company, buildings or energy systems. Energy need and consumption, and feasibility study, optimization of energy management of energy systems. Prices					condary
	trical Light 1	,			KZ	4
	5				KZ	4
	tronic security systems				KZ	4
	tronic security systems				KZ	4
	tronics	ations The funder	nontal idea in			
	tronics troengineering and intelligent buildings					
•	tronics troengineering and intelligent buildings ent systems, new technologies significantly influence various HVAC system applic	cae companying, a	ρρισαιιστι ΟΙ	in nemyerit û		igo requires
	tronics troengineering and intelligent buildings ent systems, new technologies significantly influence various HVAC system applic ironmental parameters. The influence of electromagnetic environment, electromagn				KZ	4
Introduction study of experimenta	tronics troengineering and intelligent buildings ent systems, new technologies significantly influence various HVAC system applic					4

A5M16FIP Corporate finance	KZ	4
Principles of finance, present value and alternative cost of capital, financial calculus, long-term finance, valuation of bonds and stocks, investment decis		
comparison time period, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance,	cash flow manag	gement.Dividend
policy.		
A5M13FVS Photovoltaic Systems	KZ	4
Solar energy and its exploitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (construction		,
Photovoltaic systems (including energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and ecc		, present trends.
124INBB Integrated Design of Buildings	Z,ZK	4
The main objective of the subject Integrated Building Design is to get an complex overview of the principles of integrated buildings design, life cycle asso		lings, evaluation
of building performance, green/sustainable certification systems and understand environmental, social and economic aspects of the built environment.		
A5M38MEB Measurements in the Buildings	KZ	4
The students will learn about principles of measurement of basic physical quantities in the building. As the majority of the physical quantities are conve	erted to the elec	trical signals, an
overview of measurement of the electrical quantities is also presented. The subject is not intended for students who have already studied the subjects	Electrical meas	urement and
Sensors and transducers on CTU FEE.		
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 overview of	of tools and met	hodologies for
solving these problems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, constru	uction 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 en	ergy behaviour.	
A5M13NZZ Independent sources	KZ	4
Electrochemical sources of the electric power - overview. Electrochemical sources (accumulators), applications. Uninteruptible power sources in IB. Ot	her sources of t	he electrical
energy. Perspective sources of electrical enegy, storage of energy.		
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 hydrogenergy systems are solar and building energy systems.	dro-are discuss	ed 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 fac	cilities and syste	ems that use
renewable energy sources.		
125PBZB 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 bui	ldings against fi	re spread from
technological equipment.Electric fire alarm. Fire control equipment. Backup power source.		
2162019 Industrial Heating, Ventilation, Airconditioning	KZ	4
Design and functional properties of ventilation systems for technological premises. Heat and mass transfer, aerodynamics calculation. Energy demand	ls of systems.	
A5M38SBD Collection and Data Transfer	KZ	4
2162064 Noise and Vibration Control	KZ	4
Student will be informed about the basic acoustic dimensions, which are important for evaluation of noise.		•
125SYB Building Systems	ZK	4
Multi-criteria analysis of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optin		•
energy and ecological building systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions in		•
of indoor systems and building design. E.g. office buildings, residential buildings, halls, shopping centres, cultural centres, industrial buildings, sports b		• • •
etc. The audience will be introduced to the requirements for the indoor environment, the characteristic elements of energy and environmental building systematic elements elements of energy and environmental building systematic elements		
design for the building type.		
125TECE Technological Units	KZ	4
Saunas, fireplaces, kitchen technology, elevators, heat pumps, technology, swimming pools, heat source and technological systems.		
2162113 Heating	KZ	4
Knowledge improvement from the field of heating of residential and industrial buildings. Designing of convective and radiant heating systems.	· \	т
2162066 Heat Supply	KZ	4
District heating with heat generators in heat-only and combined heat&power mode. Heat generators. Heating networks. Renewable energy source		-
ziene neurig mit neur generatere in neur eing and combined neuraling, perior meder neur generatere, neuring neuronid, renewable energy addition		

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

Code of the group: 2020_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

~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 asse	-	, evaluation
	building performance, green/sustainable certification systems and understand environmental, social and economic aspects of the bui		
124KPKP	Building Structures - Final Review	ZK	4
	tructures. Functional requirements, structural systems, spatial effect of the structural system. Vertical load-bearing structures, floor structure with the sector of the structure s		
	ings, windows, partitions, floors, suspended ceilings. Stairs, roof construction – timber roof trusses, roof envelopes. Foundation struc ubstructure, waterproofing of the substructure. Structural systems of single and multi-storey buildings, structural systems of long-spa		ution of the
			4
124OSIB	Lighting and Acoustics The course introduces students to the basics of building lighting technology and building acoustics and deepens further knowledge acoustics and building acoustics and deepens further knowledge acoustics and building acoustics and deepens further knowledge acoustics and building acoustics		4
124ST1	Thermal Engineering in Construction 1	ZK	5
-	ses the basic chapters of building physics - part hygrothermal performance of buildings in an overview manner with the aim of providin m non-construction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming	-	
125EABU	Energy Audit of Building	KZ	4
Methodology of cal object survey and s lighting, ventilating	or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy perfor culating energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial condition survey of project documentation. Determining source efficiency, distribution and emission of heat. Steps towards reduction of energy c systems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluat tection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is fo	, description of init onsumption - buildi ion, evaluation fron	ial condition ng, heating, n the aspect
	resulting to presenting case study report about energy audit of existing building.		J
125EIBB	Electroengineering and intelligent buildings	KZ	4
	ciety, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental idea is to save outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige		
405500	a system approach to solve the whole complex of HVAC and intelligent wiring.	1/7	4
125ESB Principles of enviro	Buildings Ecology Systems Inmentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system of a social and service and an activity of the service and service an	KZ esign, pumping de	4 vices, water
	saving and special installations.	1/7	4
solving these proble	Simulation of Building Energy Performance ed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of ems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, construct haviour. The aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating build	tion and other facto	ors affecting
125OZEB	Renewable Energy Sources	ZK	4
characteristics of	with renewable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal and hyd the energies and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design farenewable energy sources.	cilities and system	s that use
125PBZB	Fire Services	KZ	4
	systems,fire pipe,fire station.Fixed fire-fighting water with water mist, foam, and halon. Special fire-fighting equipment.Protecting buil technological equipment.Electric fire alarm. Fire control equipment. Backup power source.		pread from
125PIB1	Project 1	Z	6
	ject of the interfaculty course Intelligent Buildings. Its content is focused on the issue of intelligent buildings in order to link the knowled is. 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	Project 2	Z	6
Project 2 is the su	bject of the interfaculty discipline Intelligent Buildings. In the project, the student demonstrates the ability to independently develop a field of intelligent buildings.	more advanced pro	oject in the
125SYB	Building Systems	ZK	4
energy and ecologi of indoor systems a	sis of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optimi ical building systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions in o and building design. E.g. office buildings, residential buildings, halls, shopping centres, cultural centres, industrial buildings, sports bu vill be introduced to the requirements for the indoor environment, the characteristic elements of energy and environmental building systems.	lifferent building typ ildings, family hous	bes in terms ses, passive
4057505	design for the building type.		-
125TECE	Technological Units Saunas, fireplaces, kitchen technology, elevators, heat pumps, technology, swimming pools, heat source and technological sys		4
2151154	Refrigertion and heat pumps	KZ	4
The subject is ar	n introduction to the refrigeration technology and the heat pumps with the following thematic areas: • Fundamentals of thermodynami ur cycle: basic form, basic processes. • Converting of unit's parameters to other working conditions. • Improvement of the Rankin cycle s, cascade cycles. • Refrigerants: classification, nomenclature, legislation. • Sorption cycles: classification, thermodynamic fundamen absorption cycles LiBr-H20 - basic form, basic processes. • Heat pumps: heating and hot tap water. • Heat sources for HF	e's parameters. • C ts of multicompone	lassification
			4
	Radiant and Industrial Heating Student will be informed about the basics of radiant and other industrial heating systems	Z,ZK	4
of multistage cycles	· · · · · · · · · · · · · · · · · · ·	Z,ZK	4
of multistage cycles 2161102	Student will be informed about the basics of radiant and other industrial heating systems Transport Phenomena	Z,ZK	

2161567	Variation and Air Conditioning	7 71/	4
	Ventilation and Air Conditioning or design, control and evaluation of ventilation and air conditioning systems. Design according to demands for treatment of thermal a	Z,ZK	-
Main knowledge ic	air in residential and technological rooms.	1	
2162019 Design ar	Industrial Heating, Ventilation, Airconditioning Ind functional properties of ventilation systems for technological premises. Heat and mass transfer, aerodynamics calculation. Energy	KZ demands of syster	4 ns.
2162035	Alternative Energy Sources	KZ	4
	Principles and basics of alternative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization.	1	I
2162064	Noise and Vibration Control	KZ	4
	Student will be informed about the basic acoustic dimensions, which are important for evaluation of noise.		
2162066	Heat Supply	KZ	4
District heating	ng with heat generators in heat-only and combined heat&power mode. Heat generators. Heating networks. Renewable energy s	ources in district he	eating.
2162113	Heating	KZ	4
	Knowledge improvement from the field of heating of residential and industrial buildings. Designing of convective and radiant heating	g systems.	
2162700	Experimental Methods 1	KZ	4
	Introduction study of experimental technique in environmental engineering	1	1
2163033	Design IB I.	Z	6
Design of heating s	systems, heat distributors and systems for using recoverable source of energy. Design of ventilation and air conditioning systems, inclu-	ding gas cleaning ar	nd reduction
	of noise.		
2163034	Project IB II.	Z	6
	oject and experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecolo	_	
A5M13FVS	Photovoltaic Systems	KZ	4
	d its exploitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (construct		
	ns (including energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and eco		
A5M13NZZ	Independent sources	KZ	4
Electrochemical	sources of the electric power - overview. Electrochemical sources (accumulators), applications. Uninteruptible power sources in IB. C	Other sources of the	electrical
	energy. Perspective sources of electrical energy, storage of energy.		1
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5
A5M15ES1	Electrical Light 1	KZ	4
A5M16EUE	Economics of Energy Use	KZ	4
-	energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characteriz		secondary
A5M16FIP	Corporate finance	KZ	4
-	e, present value and alternative cost of capital, financial calculus, long-term finance, valuation of bonds and stocks, investment decis eriod, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance, o policy.	-	
A5M34ELE	Electronics	KZ	4
A5M34EZS	Electronic security systems	KZ	4
A5M38MEB	Measurements in the Buildings	KZ	4
The students will le overview of meas	earn about principles of measurement of basic physical quantities in the building. As the majority of the physical quantities are conve surement of the electrical quantities is also presented. The subject is not intended for students who have already studied the subject Sensors and transducers on CTU FEE.	rted to the electrica s Electrical measure	l signals, a
A5M38SBD	Collection and Data Transfer	KZ	4
A5M38SZS	Sensors and Networks Applications of sensors in buildings	Z,ZK	4
A5M99PR1	Project 1	Z	6
	esis is chosen by the student and selected from the list of topics. "Project 1" is followed by "Project 2" with a higher difficulty. The assi to the approval of the faculty guarantor or tutor. The work will be publicly presented.		-
The topic of the the			
•	Project 2	7	6
A5M99PR2	Project 2 sis 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 is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented.	Z J. The assignment o	6 f the projec
A5M99PR2 The topic of the the	esis 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 is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented.	. The assignment o	f the projec
A5M99PR2 The topic of the the ADIP26	sis 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 is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented. Diploma Thesis	/. The assignment o	f the projec
A5M99PR2 The topic of the the ADIP26 Independent final	sis 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 is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented. Diploma Thesis comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or	/ The assignment o	f the projec 26 , which will
A5M99PR2 The topic of the the ADIP26 Independent final be specified	sis 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 is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented. Diploma Thesis comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprel	Z The assignment o	f the projec 26 /, which will nation.
A5M99PR2 The topic of the the ADIP26 Independent final	sis 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 is subject to the approval of the faculty guarantor or tutor. The work will be publicly presented. Diploma Thesis comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or	/ The assignment o	f the projec 26 , which will

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