# Study plan

# Name of study plan: Program Budovy a prost edí, obor B, zam ení Technická za ízení budov

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Buildings and Environment Type of study: Follow-up master full-time Required credits: 90 Elective courses credits: 0 Sum of credits in the plan: 90 Note on the plan: tento studijní plán platí do nástupu do studia 2022/23

Name of the block: Compulsory courses Minimal number of credits of the block: 28 The role of the block: Z

Code of the group: NB20170100 Name of the group: obor Budovy a prost edí, 1. semestr Requirement credits in the group: In this group you have to gain at least 16 credits Requirement courses in the group: In this group you have to complete at least 5 courses Credits in the group: 16 Note on the group:

Note on the group	<u>,</u> dopinen	120010				
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.) Mathematics 4B					
101M04B	Petr Ku era, Zden k Skalák, Michal Beneš, Iva Malechová, Ivana Pultarová Petr Ku era Petr Ku era (Gar.)	Z,ZK	4	1P+2C	Z	Z
102FYZB	Thermomechanics Vít zslav Vydra Vít zslav Vydra (Gar.)	Z	2	2P	Z	Z
124DRS	<b>Timber Constructions</b> Milan Peukert, Kamil Stan k, Richard Hlavá , Jan Tywoniak, Jan R ži ka, Lukáš Velebil <b>Jan Tywoniak</b> Kamil Stan k (Gar.)	Z,ZK	3	2P+1C	L	Z
124INB1	Integrated Design of Buildings Antonín Lupíšek, Petr Hájek, Martin Volf, Tereza Pavl Tereza Pavl Petr Hájek (Gar.)	Z,ZK	3	2P+1C	L	Z
125SYB	Building Systems Jan Tywoniak, Karel Kabele Karel Kabele (Gar.)	ZK	4	4P	Z	Z

#### Characteristics of the courses of this group of Study Plan: Code=NB20170100 Name=obor Budovy a prost edí, 1. semestr

101M04B	Mathematics 4B	Z,ZK	4				
https://mat.fsv.cvut.cz/k	ucera/						
102FYZB	Thermomechanics	Z	2				
This course will concentrate on basic principles of transport of heat and mass (conduction, convection, radiation, heat pumps; transport of moist in building materials) with practical							
examples such as heat	loss of a pipe, solar heating/cooling systems and heat loss thru a window (two plates of glass with a gas between). An excur	sion to a large sol	ar-cooling				
installation with a solar-	powered heat pump is a part of the course.						
124DRS	Timber Constructions	Z,ZK	3				
Students will learn about	t the complex issues of designing modern wooden buildings. The introductory block of lectures is dedicated to the material b	ase, structural sy	stems, and				
mechanical properties of	of wood and wood-based materials. The principles of ensuring spatial rigidity of the light frame and mass-timber structural sy	stems are present	ed. It follows a				
lecture block focused or	n the design of envelope constructions of wooden buildings, moisture safety, biological threats, and principles of wood protect	tion. In the following	ng two lectures,				
	nd the interaction of the wood substance with air humidity, which has a significant effect on all technical properties of wood, a						
	o passive measures to reduce the risk of summer overheating of wooden buildings. In the last lecture, construction technology	is discussed and a	a comprehensive				
approach to the design	of modern wooden buildings is emphasised.						
124INB1	Integrated Design of Buildings	Z,ZK	3				
The main objective of th	The main objective of the subject Integrated Building Design is to get an complex overview of the principles of integrated buildings design, life cycle assessment of buildings, evaluation						
of building performance	, green/sustainable certification systems and understand environmental, social and economic aspects of the built environme	nt.					

#### 125SYB Building Systems

Multi-criteria analysis of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optimization criteria for the design of energy and ecological building systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions in different building types in terms of indoor systems and building design. E.g. office buildings, residential buildings, halls, shopping centres, cultural centres, industrial buildings, sports buildings, family houses, passive etc. The audience will be introduced to the requirements for the indoor environment, the characteristic elements of energy and environmental building systems in relation to the structural design for the building type.

ΖK

#### Code of the group: NB20160200

Name of the group: obor Budovy a prost edí, 2. semestr

Requirement credits in the group: In this group you have to gain at least 12 credits

Requirement courses in the group: In this group you have to complete at least 4 courses

Credits in the group: 12

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
124ST2B	Thermal Engineering in Construction 2 Zbyn k Svoboda, Pavel Kopecký Zbyn k Svoboda Zbyn k Svoboda (Gar.)	Z	2	1P+1C	L	Z
125EAB1	Energy audit 1 Karel Kabele, Michal Kabrhel, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	KZ	3	2P+1C	L	Z
125MEBU	Building energy performance modelling Karel Kabele, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	KZ	3	1P+2C	L	Z
125VKB	Ventilation and Air conditioning of Buildings Daniel Adamovský Daniel Adamovský Daniel Adamovský (Gar.)	Z,ZK	4	2P+1C	L	Z

#### Characteristics of the courses of this group of Study Plan: Code=NB20160200 Name=obor Budovy a prost edí, 2. semestr

124ST2B	Thermal Engineering in Construction 2	Z	2
Improvement of knowled	lge from the basic building physics course. Detailed analysis of boundary conditions for calculations, governing equations of	heat and water va	apor transfer
(diffusion, convection), t	hermal transmittance of windows and curtain walling, CFD, ventilated double-skin constructions, energy performance of build	dings in detail, the	rmal protection
of historical buildings.			
125EAB1	Energy audit 1	KZ	3
Advanced course for intr	oduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy p	erformance direct	ive for buildings.
Methodology of calculat	ng energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial condi	tion, description o	f initial condition
object survey and surve	y of project documentation. Determining source efficiency, distribution and emission of heat. Steps towards reduction of energ	y consumption - b	uilding, heating,
lighting, ventilating syste	ens, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical eval	uation, evaluation	from the aspect
of environment protection	n. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is	s focused on the r	ealistic buildings
resulting to presenting of	ase study report about energy audit of existing building.		
125MEBU	Building energy performance modelling	KZ	3
The course is aimed at	explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview	v 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, cons	truction 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 e	energy behaviour.	
125VKB	Ventilation and Air conditioning of Buildings	Z,ZK	4
An advanced course in	ventilation and air conditioning focused on deepening the core topics in the field of ventilation of specific facilities, basics of fi	re and smoke ver	itilation,
air-conditioning and coc	ling.		

Name of the block: Povinné p edm ty zam ení Minimal number of credits of the block: 26 The role of the block: PZ

Code of the group: NB20170201

Name of the group: obor B, zam ení Technická za ízení, p edm ty zam ení Requirement credits in the group: In this group you have to gain at least 26 credits Requirement courses in the group: In this group you have to complete at least 6 courses Credits in the group: 26

Note on the group:

[1:14][2:12]

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
125EBU	Electrotechnics and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.)	ZK	3	2P	Z	PZ
125SPB1	Specialized design project 1 Stanislav Frolík Stanislav Frolík (Gar.)	KZ	4	3C	Z	PZ

125VPVA	Indoor environmental quality and space heating A Karel Kabele, Michal Kabrhel, Zuzana Veverková, Pavla Dvo áková, Hana Kabrhelová Hana Kabrhelová Karel Kabele (Gar.)	ZK	7	4P+2C	Z	PZ
125LTZB	Laboratory of Building Services Systems Michal Kabrhel Michal Kabrhel (Gar.)	Z	2	2C	L	ΡZ
125SPB2	Specialized design project 2 Karel Kabele, Michal Kabrhel, Miroslav Urban, Zuzana Veverková, Daniel Adamovský, Pavla Dvo áková, Bohumír Garlík, Hana Kabrhelová, Stanislav Frolík, Stanislav Frolík Stanislav Frolík (Gar.)	ΚZ	5	4C	L	PZ
125ZTTB	Sanitary and technological equipment and installations Stanislav Frolík, Ilona Koubková Stanislav Frolík Stanislav Frolík (Gar.)	ZK	5	4P	L	PZ

#### Characteristics of the courses of this group of Study Plan: Code=NB20170201 Name=obor B, zam ení Technická za ízení, p edm ty

125EBU	Electrotechnics and intelligent buildings	ZK	3
The information so	ciety, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental idea is to s	save energy, mate	rials and ensure
optimal indoor and	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intel	lligent devices in b	uildings requires
a system approach	to solve the whole complex of HVAC and intelligent wiring.		
125SPB1	Specialized design project 1	KZ	4
Design project is ar problem of building	n independent subject for the students of Master degree study programme of Buildings and Environment. Students should prove of services systems.	deeper knowledge	e concerning the
125VPVA	Indoor environmental guality and space heating A	ZK	7
and the environmer	al building facilities focusing on a comprehensive view of the quality of the indoor environment in terms of its impact on health, worl nt. An in-depth section focusing on the analysis and design of building energy systems that provide for the generation, transforma	ation and distribution	on of energy in
buildings to ensure	thermal comfort in winter and an optimal indoor environment with minimal environmental impact. Practical application of the topic	cs is carried out in	the seminars.
125LTZB	Laboratory of Building Services Systems	Z	2
	Laboratory of Building Services Systems s on practical work in the field of building services systems. In the course measuring devices parameters will be explained and practical work in the field of building services systems.	Z actical problems w	2
		Z actical problems w KZ	2
The course focuses 125SPB2	s on practical work in the field of building services systems. In the course measuring devices parameters will be explained and pra Specialized design project 2 n independent subject for the students of Master degree study programme of Buildings and Environment. Students should prove	KZ	2 vill be solved. 5
The course focuses 125SPB2 Design project is ar	s on practical work in the field of building services systems. In the course measuring devices parameters will be explained and pra Specialized design project 2 n independent subject for the students of Master degree study programme of Buildings and Environment. Students should prove	KZ	2 vill be solved. 5
The course focuses 125SPB2 Design project is ar problem of building 125ZTTB Principles of environ saving and special	s on practical work in the field of building services systems. In the course measuring devices parameters will be explained and practical specialized design project 2 n independent subject for the students of Master degree study programme of Buildings and Environment. Students should prove a services systems.	KZ deeper knowledge ZK m design, pumpin , kitchens for com	2 vill be solved. 5 e concerning the 5 g devices, wate munal meals,

## Name of the block: Compulsory elective courses Minimal number of credits of the block: 6 The role of the block: S

Code of the group: NB20160201\_1 Name of the group: obor B, zam ení Technická za ízení, povinn volitelné p edm ty Requirement credits in the group: In this group you have to gain at least 6 credits Requirement courses in the group: In this group you have to complete at least 2 courses 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
124YBM1	Building Information Modeling (BIM) for Building Structures 1 Hana Kabrhelová, Stanislav Frolík, Pavel Chour, Renáta Ho ánková, Jakub Veselka, Petr Mat jka, Petr Pánek, Kate ina Šenfeld Jan R ži ka Jan R ži ka (Gar.)	Z	4	1P+3C	Z	S
124YKSD	Complex Structural Detail Ji í Pazderka, Radek Zigler <b>Ji í Pazderka</b> Ji í Pazderka (Gar.)	Z	2	1P+1C	Z	S
124YPZB	Fire Prevention and Healthy Buildings Vladimír Mózer, Marek Pokorný Marek Pokorný Vladimír Mózer (Gar.)	Z	2	2P		S
125YATM	Applied Thermomechanics Daniel Adamovský Daniel Adamovský Daniel Adamovský (Gar.)	Z	2	1P+1C	Z	S
125YOPZ	Gas services systems Ilona Koubková Ilona Koubková Ilona Koubková (Gar.)	Z	2	1P+1C	L	S
125YOZE	Renewable Energy Sources Michal Kabrhel Michal Kabrhel Michal Kabrhel (Gar.)	Z	2	2P	L	S
125YUOB	Artifical illumination Pavla Dvo áková, Bohumír Garlík Pavla Dvo áková Pavla Dvo áková (Gar.)	Z	2	1P+1C	L	S
143APE	Applied Ecology Tomáš Dostál Tomáš Dostál (Gar.)	Z	2	2P	L	S

Characteristics of the courses of this group of Study Plan: Code=NB20160201\_1 Name=obor B, zam ení Technická za ízení, povinn volitelné p edm ty

124YBM1 Building Information Modeling (BIM) for Building Structures 1	Z	4
Building information model (BIM) - basic principles of creating a building information model in the field of civil engineering, specifics of BIM modeli	ng. The subject use	s the Autodesk
Revit software base. Building information model in the life cycle of the building - information required during the design part, during construction and	d during use of the	finished building.
124YKSD Complex Structural Detail	Z	2
The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level	I of knowledge abo	ut structural
problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements ar	d taking into accou	nt the maximum
efficiency and durability of the chosen solution.		
124YPZB Fire Prevention and Healthy Buildings	Z	2
The subject is focused on the presentation of the basic concepts and principles of fire safety of buildings and health safety of buildings. It is intended	d for students of no	on-fire disciplines
and should enable them to consider aspects of fire safety and health safety from the initial stages of project preparation of buildings.		
125YATM Applied Thermomechanics	Z	2
The course Applied thermocheanics contains three basic groups, in which the student is gradually introduced to selected chapters on moist air, va	pour thermodynam	ics and heat
sharing. The aim of each chapter is to introduce students to the principles of equipment common in heating, ventilation and cooling systems that t	ney will encounter in	n practice. The
chapter on humid air will discuss typical and lesser used processes occurring in air handling units. The vapor thermodynamics section focuses on the	familiar compresso	or and absorption
chillers and heat pumps. The final chapter will explain the processes and principles related to heat exchangers.		
125YOPZ Gas services systems	Z	2
Gas connections - draft, addressing gas in the building, including design and assessment of gas appliances, pipe sizing and pressure loss dimensional distributions of the second distribution of the second distributication of the second d	ioning pipe examin	ation rooms in
terms of the amount of air for combustion, alternative solutions for propane-butane.		
125YOZE Renewable Energy Sources	Z	2
The course deals with renewable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal an	d hydro-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	n facilities and system	ems that use
renewable energy sources.		
125YUOB Artifical illumination	Z	2
The course provides a basic introduction to artificial lighting. Lighting technical quantities and related calculations are included. The theoretical print	ciples of indoor light	nting and lighting
systems are discussed with application to various types of buildings and plants. Students are introduced to an overview of light sources and lumina	ires and their chara	cteristics. Power,
control and management and maintenance of lighting systems are also discussed along with energy consumption. There is also basic information		ting and outdoor
lighting. Excursions are also part of the teaching. During the tutorials, a lighting project (plus electrical) is designed for a given space using the DI/	Lux evo software.	
143APE Applied Ecology	Z	2
Learning basic of ecological terminology, landscape ecology and ecological stability. Energy flow in the different ecosystems.		
Name of the block: Doving velitelné p. odm. tv. doporu, opí 82		

#### Name of the block: Povinn volitelné p edm ty, doporu ení S2 Minimal number of credits of the block: 30 The role of the block: S2

## Code of the group: NB20160301

Name of the group: obor B, zam ení Technická za ízení, diplomová práce Requirement credits in the group: In this group you have to gain 30 credits Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 30 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
125DPM	Diploma Thesis Stanislav Frolík Stanislav Frolík (Gar.)	Z	30	24C	Z	S2

### Characteristics of the courses of this group of Study Plan: Code=NB20160301 Name=obor B, zam ení Technická za ízení, diplomová

prace						
125DPM	Diploma Thesis	Z	30			
Diploma thesis is an inc	ependent project of a student at the end of Master degree study programme at the Faculty of Civil Engineering. Diploma the	sis consists of two	sections, a			
diploma thesis seminar	diploma thesis seminar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the topic of the thesis. The student					
consults the supervisor						

### List of courses of this pass:

Code	Name of the course	Completion	Credits			
101M04B	Mathematics 4B	Z,ZK	4			
	https://mat.fsv.cvut.cz/kucera/					
102FYZB	Thermomechanics	Z	2			
This course will co	This course will concentrate on basic principles of transport of heat and mass (conduction, convection, radiation, heat pumps; transport of moist in building materials) with practical					
examples such	examples such as heat loss of a pipe, solar heating/cooling systems and heat loss thru a window (two plates of glass with a gas between). An excursion to a large solar-cooling					
	installation with a solar-powered heat pump is a part of the course.					

124DRS	Timber Constructions	Z,ZK	3		
	rn about the complex issues of designing modern wooden buildings. The introductory block of lectures is dedicated to the material bartice of wood and wood based materials. The principles of ensuring applied rigidity of the light frame and more timber structurel surface.	-			
mechanical properties of wood and wood-based materials. The principles of ensuring spatial rigidity of the light frame and mass-timber structural systems are presented. It follows a lecture block focused on the design of envelope constructions of wooden buildings, moisture safety, biological threats, and principles of wood protection. In the following two lectures,					
the structure of wood and the interaction of the wood substance with air humidity, which has a significant effect on all technical properties of wood, are described in more detail. The					
	ted to passive measures to reduce the risk of summer overheating of wooden buildings. In the last lecture, construction technology is di				
	approach to the design of modern wooden buildings is emphasised.				
124INB1	Integrated Design of Buildings	Z,ZK	3		
	of the subject Integrated Building Design is to get an complex overview of the principles of integrated buildings design, life cycle asse	-	s, evaluation		
	building performance, green/sustainable certification systems and understand environmental, social and economic aspects of the buil		-		
124ST2B	Thermal Engineering in Construction 2	Z	2		
	knowledge from the basic building physics course. Detailed analysis of boundary conditions for calculations, governing equations of h ion), thermal transmittance of windows and curtain walling, CFD, ventilated double-skin constructions, energy performance of building				
	of historical buildings.	go in dotail, thorna	i protoction		
124YBM1	Building Information Modeling (BIM) for Building Structures 1	Z	4		
Building information	on model (BIM) - basic principles of creating a building information model in the field of civil engineering, specifics of BIM modeling. T	he subject uses the	e Autodesk		
Revit software base	e. Building information model in the life cycle of the building - information required during the design part, during construction and duri	ng use of the finish	ed building.		
124YKSD	Complex Structural Detail	Z	2		
	burse is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of	-			
problems in buildin	gs. The content of the course is focused on the complex solution of construction details, following all legislative requirements and tak	ing into account the	e maximum		
124YPZB	efficiency and durability of the chosen solution. Fire Prevention and Healthy Buildings	Z	2		
	sed on the presentation of the basic concepts and principles of fire safety of buildings and health safety of buildings. It is intended for				
· · · · <b>,</b> · · · · · · · · ·	and should enable them to consider aspects of fire safety and health safety from the initial stages of project preparation of build				
125DPM	Diploma Thesis	Z	30		
	an independent project of a student at the end of Master degree study programme at the Faculty of Civil Engineering. Diploma thesi				
diploma thesis sem	inar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the consults the supervisor.	topic of the thesis.	The student		
125EAB1	Energy audit 1	KZ	3		
	printroduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy perfo	1	-		
Methodology of cal	culating energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial condition	, description of init	ial 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		-		
of environment prot	tection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is fo resulting to presenting case study report about energy audit of existing building.	cused on the realis	tic buildings		
125EBU	Electrotechnics and intelligent buildings	ZK	3		
125600					
The information so	ciety, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental idea is to save	1	-		
	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	e energy, materials	and ensure		
optimal indoor and o	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring.	e energy, materials	and ensure		
optimal indoor and one optimal indoor and one optimal indoor and one optimal indoor and one optimal indoor and o	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems	e energy, materials nt devices in buildir Z	and ensure ngs requires 2		
optimal indoor and on a second	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems es on practical work in the field of building services systems. In the course measuring devices parameters will be explained and prac	e energy, materials nt devices in buildir Z tical problems will	and ensure ngs requires 2 be solved.		
optimal indoor and o 125LTZB The course focus 125MEBU	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems es on practical work in the field of building services systems. In the course measuring devices parameters will be explained and prac Building energy performance modelling	e energy, materials nt devices in buildir Z tical problems will KZ	and ensure ngs requires 2 be solved. 3		
optimal indoor and optimal indoo	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems es on practical work in the field of building services systems. In the course measuring devices parameters will be explained and prac Building energy performance modelling ed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of	e energy, materials nt devices in buildir Z tical problems will KZ f tools and method	and ensure ngs requires 2 be solved. 3 dologies for		
optimal indoor and optimal indoo	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems es on practical work in the field of building services systems. In the course measuring devices parameters will be explained and prac Building energy performance modelling	e energy, materials nt devices in buildir Z tical problems will KZ of tools and methoc tion and other factor	and ensure ngs requires 2 be solved. 3 dologies for ors affecting		
optimal indoor and optimal indoo	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems es on practical work in the field of building services systems. In the course measuring devices parameters will be explained and prac Building energy performance modelling ed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of erms and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, construct	e energy, materials nt devices in buildir Z tical problems will KZ of tools and methoc tion and other factor	and ensure ngs requires 2 be solved. 3 dologies for ors affecting		
optimal indoor and optimal indoo	outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intellige a system approach to solve the whole complex of HVAC and intelligent wiring. Laboratory of Building Services Systems es on practical work in the field of building services systems. In the course measuring devices parameters will be explained and prac Building energy performance modelling ed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of erms 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	e energy, materials nt devices in buildir Z tical problems will KZ of tools and methoc ction and other fact ding energy behavi KZ	and ensure ngs requires 2 be solved. 3 dologies for ors affecting our. 4		
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125YOZE	Renewable Energy Sources	Z	2			
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.						
125YUOB	Artifical illumination	Z	2			
The course provides a basic introduction to artificial lighting. Lighting technical quantities and related calculations are included. The theoretical principles of indoor lighting and lighting						
systems are discussed with application to various types of buildings and plants. Students are introduced to an overview of light sources and luminaires and their characteristics. Power,						
control and management and maintenance of lighting systems are also discussed along with energy consumption. There is also basic information on emergency lighting and outdoor						
lighting. Excursions are also part of the teaching. During the tutorials, a lighting project (plus electrical) is designed for a given space using the DIALux evo software.						
125ZTTB	Sanitary and technological equipment and installations	ZK	5			
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. The field of technological equipment of buildings deals with the issues of saunas and fireplaces, elevator technology, kitchens for communal meals,						
heat pumps, swimming pool technologies, gas boiler rooms in residential and civic buildings. As part of the subject, excursions are made to selected objects related to the subject being						
taught.						
143APE	Applied Ecology	Z	2			
Learning basic of ecological terminology, landscape ecology and ecological stability. Energy flow in the different ecosystems.						

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2024-05-13, time 15:15.