Study plan

Name of study plan: Budovy a prost edí, specializace 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: platí pro nástup od akad. roku 2023/24

Name of the block: Compulsory courses Minimal number of credits of the block: 53

The role of the block: Z

Code of the group: NB20230100

Name of the group: Budovy a prost edí, spole ná ást, 1. semestr

Requirement credits in the group: In this group you have to gain at least 17 credits

Requirement courses in the group: In this group you have to complete at least 5 courses

Credits in the group: 17 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
101APM	Applied Mathematics Zden k Skalák, Petr Ku era Zden k Skalák Petr Ku era (Gar.)	Z,ZK	3	1P+1C	Z	Z
102FYZB	Thermomechanics Vít zslav Vydra Vít zslav Vydra (Gar.)	Z	2	2P	Z	Z
124SF2B	Building Physics 2 Zbyn k Svoboda, Jaroslav Vychytil Jaroslav Vychytil Zbyn k Svoboda (Gar.)	Z,ZK	4	2P+2C	Z	Z
125SYB	Building Systems Karel Kabele, Jan Tywoniak Karel Kabele Karel Kabele (Gar.)	ZK	4	4P	Z	Z
125VVKB	Heating, Ventilation and Air Conditioning of Buildings Karel Kabele, Daniel Adamovský, Michal Kabrhel, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	ZK	4	4P	Z	Z

Characteristics of the courses of this group of Study Plan: Code=NB20230100 Name=Budovy a prost edi, spole ná ást, 1. semestr

101APM	Applied Mathematics	Z,ZK	3	l
basic concepts of different	ential and integral calculus of functions of one and more real variables, basic concepts from linear algebra, solutions of syste	ms of liner algebr	aic equations,	l
boundary problems for o	ordinary and partial differential equations (ODE,PDE), concept of classical solution, weak formulations of boundary problems	s, weak solutions,	Lax-Milgram	
lemma, existence of we	ak solution, boundary problems for linear ODE of second order with mixed boundary conditions, relation between classial and	d weak solution, re	egularity of weak	
solutions, finite difference	e method, finite element method for solutions of boundary problems, solution of Laplace's and Poisson's equations by finite o	lifference method	l, solution of heat	
equation by finite differe	nce method, one-dimensional case, solution of heat equation by finite difference method, two-dimensional case, solution of	heat equation by	finite element	
method one-dimension	al case			

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 excursion to a large solar-cooling installation with a solar-powered heat pump is a part of the course.

124SF2B | Building Physics 2 | Z,ZK | 4

Extension and supplementation of knowledge from the basic course in building physics. Detailed analysis of boundary conditions for calculations, governing equations, thermal transmittance of windows and curtain walls, linear and point thermal transmittance, ventilated constructions, energy performance of buildings, thermal protection of historic buildings, complex thermal engineering problems. Sunlight and solar radiation, effect of size and position of lighting aperture, effect of pre-set structures on lighting, choice of surface colours, risk of glare, sound insulation, calculation of sound insulation, sound propagation in building interiors, importance of absorptive and reflective properties of building structures, noise reduction by structural design, sound propagation from building to exterior, necessary properties of designed screens.

25SYB Building Systems

ZK

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.

125VVKB Heating, Ventilation and Air Conditioning of Buildings

ZK

4

An advanced course in heating, ventilation and air conditioning of buildings focused on the integrated design and operation of technical systems for the production, transformation and distribution of energy in buildings to ensure thermal comfort, air quality and optimum indoor environment with minimal environmental impact. Knowledge at the level of undergraduate basic courses in heating and ventilation is assumed for graduation).

Code of the group: NB20230200

Name of the group: Budovy a prost edí, spole ná ást, 2. semestr

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
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
125EABB	Energy Audit of Buildings Karel Kabele, Michal Kabrhel, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	Z,ZK	3	2P+1C	L	Z

Characteristics of the courses of this group of Study Plan: Code=NB20230200 Name=Budovy a prost edí, spole ná ást, 2. semestr

124INB1 Integrated Design of Buildings Z,ZK 3
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 environment.

125EABB | Energy Audit of Buildings | Z,ZK | 3 Advanced course for introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy performance directive for buildings. Methodology of calculating energy performance of buildings. Energy audit - procedure and parts. Sankey energy flow diagram. Analysis of initial condition, description of initial condition object survey and survey of project documentation. Determining source efficiency, distribution and emission of heat. Steps towards reduction of energy consumption - building, heating, lighting, ventilating systems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluation, evaluation from the aspect of environment protection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is focused on the realistic buildings resulting to presenting case study report about energy audit of existing building.

Code of the group: NB20230301

Name of the group: Technická za ízení budov, diplomová práce

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

Characteristics of the courses of this group of Study Plan: Code=NB20230301 Name=Technická za ízení budov, diplomová práce

125DPM Diploma Thesis Z 30

Diploma thesis is an independent project of a student at the end of Master degree study programme at the Faculty of Civil Engineering. Diploma thesis consists of two sections, a 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.

Name of the block: Povinné p edm ty specializace

Minimal number of credits of the block: 31

The role of the block: PS

Code of the group: NB20230101 1

Name of the group: Technická za ízení budov, p edm ty specializace, 1. semestr Requirement credits in the group: In this group you have to gain at least 11 credits Requirement courses in the group: In this group you have to complete at least 4 courses

Credits in the group: 11 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
125ZTZB	Building Sanitary Systems Stanislav Frolik Stanislav Frolik (Gar.)	ZK	3	2P	Z	PS
125SZTC	Seminar on Heating and Cooling of Buildings Michal Kabrhel Michal Kabrhel (Gar.)	Z	2	2C	Z	PS
125SVKB	Seminar on Ventilation and Air-conditioning of Buildings Daniel Adamovský Daniel Adamovský (Gar.)	Z	2	2C	Z	PS
125SPB1	Specialized design project 1 Stanislav Frolík Stanislav Frolík (Gar.)	KZ	4	3C	Z	PS

Characteristics of the courses of this group of Study Plan: Code=NB20230101_1 Name=Technická za ízení budov, p edm ty specializace,

ı. Semesu			
125ZTZB	Building Sanitary Systems	ZK	3
Principles of environ	mentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, syste	m design, pumpin	g devices, wate
saving and special in	nstallations.		
125SZTC	Seminar on Heating and Cooling of Buildings	Z	2
Practical knowledge	of the hydraulics of heating and cooling systems enables a deeper understanding of these issues and leads to better design of these	e systems. It aims	at understandin
the practical use of	lesign tools and programs for design in the field of heating and cooling of buildings.		
125SVKB	Seminar on Ventilation and Air-conditioning of Buildings	Z	2
The course develops	skey topics in the field of HVAC in the form of exercises. It focuses on the practical steps of the design of these systems in vario	us operations cha	racterized by
specific requirement	s for ventilation, moisture control, heat load, etc. In the individual exercises, students will learn about the design of HVAC plant,	iire ventilation, as:	sessment of
measures to limit no	ise and vibrations in the HVAC system, measurement and control, etc.		
125SPB1	Specialized design project 1	KZ	4
Design project is an	independent subject for the students of Master degree study programme of Buildings and Environment. Students should prove	deeper knowledge	concerning th
problem of building s	ervices systems.		

Code of the group: NB20230201_1

Name of the group: Technická za ízení budov, p edm ty specializace, 2. semestr Requirement credits in the group: In this group you have to gain at least 20 credits

Requirement courses in the group: In this group you have to complete at least 7 courses

Credits in the group: 20 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
125VPTZ	Indoor Environment of Buildings Pavla Dvo áková, Zuzana Veverková Zuzana Veverková (Gar.)	KZ	2	2P	L	PS
125TCHB	Technological Equipment of Buildings Ilona Koubková, Hana Kabrhelová, Pavla Hofbauer Pechová Ilona Koubková Ilona Koubková (Gar.)	ZK	3	2P	L	PS
125MBTZ	Building and HVAC Systems Modelling Karel Kabele, Miroslav Urban Karel Kabele Karel Kabele (Gar.)	KZ	3	1P+1C	L	PS
125LTZB	Laboratory of Building Services Systems Michal Kabrhel Michal Kabrhel (Gar.)	Z	2	2C	L	PS
125CHLA	Cooling of Buildings Miroslav Urban Miroslav Urban (Gar.)	ZK	3	2P	L	PS
125OZE1	Renewable Energy Sources Michal Kabrhel Michal Kabrhel (Gar.)	ZK	3	2P	Z,L	PS
125SP2B	Specialized Design Project 2 Karel Kabele, Michal Kabrhel, Miroslav Urban, Vojt ch Mazanec, Ilona Koubková, Bohumír Garlík, Stanislav Frolík, Hana Kabrhelová, Pavla Dvo áková, Karel Kabele Karel Kabele (Gar.)	KZ	4	3C	L	PS

Characteristics of the courses of this group of Study Plan: Code=NB20230201_1 Name=Technická za ízení budov, p edm ty specializace, 2. semestr

125VPTZ	KZ	2						
The course introduces students to the basic knowledge of the aspects of indoor environmental quality of buildings. Both theoretical and practical fundamentals of indoor environmental								
issues will be discussed	issues will be discussed during the lectures.							
125TCHB	Technological Equipment of Buildings	ZK	3					
Sauna, fireplaces, kitch	Sauna, fireplaces, kitchen technology, elevators, technology swimming pools, heat pumps, heat source and technological system, technology cooling, fire safety equipment, sprinklers.							

125MBTZ	Building and HVAC Systems Modelling	KZ	3
The course is aim	ed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview	w of tools and me	hodologies for
solving these prob	ems 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 each of the course is to provide students with basic knowledge and practical experience in modelling and simulating building each of the course is to provide students with basic knowledge and practical experience in modelling and simulating building each of the course is to provide students with basic knowledge and practical experience in modelling and simulating building each of the course is to provide students with basic knowledge and practical experience in modelling and simulating building each of the course is to provide students.	energy behaviour.	
125LTZB	Laboratory of Building Services Systems	Z	2
The course focuse	s on practical work in the field of building services systems. In the course measuring devices parameters will be explained and pra	actical problems v	vill be solved.
125CHLA	Cooling of Buildings	ZK	3
The course focuse	s on the basic introduction to cooling technology used for air conditioning of buildings. In the introductory part, students will be intr	roduced to the ba	sic theoretical
foundations of the	modynamics, design and sizing requirements for cooling technology. The core part of the course is aimed at familiarizing students	s with various sys	em solutions of
refrigeration techn	ology for building air conditioning.		
125OZE1	Renewable Energy Sources	ZK	3
Panawahla aguras	s are becoming increasingly important sources of energy for buildings. Understanding their characteristics is key to the proper desig	n and operation c	f these systems.
Reflewable source			
	ore looks in detail at renewable sources and their applications.		
	·	KZ	4
The course therefore 125SP2B	size looks in detail at renewable sources and their applications. Specialized Design Project 2 Strocused on the design of technical equipment of buildings. The student chooses a topic based on his/her major and uses the known of the control of		4

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 6

The role of the block: PV

Code of the group: NB20230101 2

Name of the group: Technická za ízení budov, PV p edm ty, 1. semestr

Requirement credits in the group: In this group you have to gain at least 2 credits

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

Credits in the group: 2 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
125YATM	Applied Thermomechanics Daniel Adamovský Daniel Adamovský (Gar.)	Z	2	1P+1C	Z	PV
125YPNT	Spatial Designing of Building Services Systems Stanislay Frolik Stanislay Frolik (Gar.)	Z	2	2C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=NB20230101_2 Name=Technická za ízení budov, PV p edm ty, 1. semestr

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, vapour thermodynamics and heat								
sharing. The aim of eac	sharing. The aim of each chapter is to introduce students to the principles of equipment common in heating, ventilation and cooling systems that they will encounter in practice. The							
chapter on humid air wil	discuss typical and lesser used processes occurring in air handling units. The vapor thermodynamics section focuses on the fa	amiliar compresso	r and absorption					
chillers and heat pumps	chillers and heat pumps. The final chapter will explain the processes and principles related to heat exchangers.							
125YPNT	Spatial Designing of Building Services Systems	Z	2					
Designation to about a libert								

Designing technical building equipment systems with a focus on 3D modeling and related auxiliary calculation tools. Conversion of models into universal formats for use in other tools according to their focus and technical capabilities. Focus on projection in the BIM environment.

Code of the group: NB20230201 2

Name of the group: Technická za ízení budov, PV p edm ty, 2. semestr

Requirement credits in the group: In this group you have to gain at least 4 credits

Requirement courses in the group: In this group you have to complete at least 2 courses

Credits in the group: 4

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
143APE	Applied Ecology Tomáš Dostál Tomáš Dostál (Gar.)	Z	2	2P	L	PV
125YUOB	Artifical illumination Bohumír Garlík, Pavla Dvo áková Pavla Dvo áková (Gar.)	Z	2	1P+1C	L	PV
125YEMR	Electrotechnical Engineering, Measurement and Control of HVAC Systems Michal Kabrhel, Bohumír Garlík Michal Kabrhel Michal Kabrhel (Gar.)	Z	2	2P	L	PV
125YOPZ	Gas services systems Ilona Koubková Ilona Koubková (Gar.)	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=NB20230201_2 Name=Technická za ízení budov, PV p edm ty, 2.

301110311								
143APE	Applied Ecology	Z	2					
Learning basic of ecolog	gical terminology, landscape ecology and ecological stability. Energy flow in the different ecosystems.							
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 v	with application to various types of buildings and plants. Students are introduced to an overview of light sources and luminaire	es 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 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.								
125YEMR	Electrotechnical Engineering, Measurement and Control of HVAC Systems	Z	2					
The course deals with selected fundamentals of electrical engineering. The concept of smart cities and smart buildings is also addressed. Approaches and systems for designing and								
evaluating building systems are discussed.								
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 dimensio	ning pipe examin	ation rooms in					
terms of the amount of a	air for combustion, alternative solutions for propane-butane.							

List of courses of this pass:

	Name of the course	Completion	Credits
101APM	Applied Mathematics	Z,ZK	3
-	differential and integral calculus of functions of one and more real variables, basic concepts from linear algebra, solutions of systems		
•	ns for ordinary and partial differential equations (ODE,PDE), concept of classical solution, weak formulations of boundary problems, w	_	-
			•
	of weak solution, boundary problems for linear ODE of second order with mixed boundary conditions, relation between classial and weather a state of finite plants of the state	=	-
	erence method, finite element method for solutions of boundary problems, solution of Laplace's and Poisson's equations by finite difference method, finite element method for solutions of boundary problems, solution of Laplace's and Poisson's equations by finite difference method, finite element method for solutions of boundary problems, solution of Laplace's and Poisson's equations by finite difference method, finite element method for solutions of boundary problems, solution of Laplace's and Poisson's equations by finite difference method, finite element method for solutions of boundary problems, solution of Laplace's and Poisson's equations by finite difference method for solutions and problems.		
equation by finite	difference method, one-dimensional case, solution of heat equation by finite difference method, two-dimensional case, solution of heat	at equation by fini	te element
	method, one-dimensional case.		
102FYZB	Thermomechanics	Z	2
This course will c	oncentrate on basic principles of transport of heat and mass (conduction, convection, radiation, heat pumps; transport of moist in builc	ding materials) wit	th 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 excursi	on to a large sola	r-cooling
	installation with a solar-powered heat pump is a part of the course.		
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 assess	•	
-	building performance, green/sustainable certification systems and understand environmental, social and economic aspects of the built	_	o, oraidano.
124SF2B	Building Physics 2	Z.ZK	4
	,	,	1
	supplementation of knowledge from the basic course in building physics. Detailed analysis of boundary conditions for calculations, gov		
	indows and curtain walls, linear and point thermal transmittance, ventilated constructions, energy performance of buildings, thermal pr		_
•	engineering problems. Sunlight and solar radiation, effect of size and position of lighting aperture, effect of pre-set structures on lighting	_	
risk of glare, soun	d insulation, calculation of sound insulation, sound propagation in building interiors, importance of absorptive and reflective properties	of building struct	ures, noise
	reduction by structural design, sound propagation from building to exterior, necessary properties of designed screens.		
125CHLA	Cooling of Buildings	ZK	3
The course focus	es on the basic introduction to cooling technology used for air conditioning of buildings. In the introductory part, students will be introdu	uced to the basic	theoretical
foundations of the	modynamics, design and sizing requirements for cooling technology. The core part of the course is aimed at familiarizing students with	h various system	solutions of
	refrigeration technology for building air conditioning.		
125DPM	Diploma Thesis	7	
D: 1	' cara a car	Z	30
Diploma thesis is	an independent project of a student at the end of Master degree study programme at the Faculty of Civil Engineering. Diploma thesis		
	s an independent project of a student at the end of Master degree study programme at the Faculty of Civil Engineering. Diploma thesis hinar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to	consists of two s	ections, a
		consists of two s	ections, a
diploma thesis sem	ninar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor.	consists of two sopic of the thesis.	sections, a The studen
diploma thesis sem	ninar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings	consists of two sopic of the thesis. Z,ZK	sections, a The studen
diploma thesis sem	ninar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy performance.	consists of two sopic of the thesis. Z,ZK rmance directive f	sections, a The studen 3 for buildings
125EABB Advanced course for Methodology of call	ninar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy performance of buildings, legislation. EPDB - energy performance of buildings.	z consists of two sopic of the thesis. Z,ZK rmance directive f description of init	sections, a The studen 3 for buildings
125EABB Advanced course for Methodology of call object survey and s	inar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy perforculating 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 constitutions.	z consists of two sopic of the thesis. Z,ZK rmance directive f description of init	rections, a The studen 3 For buildings tial conditior, heating,
125EABB Advanced course for Methodology of cal object survey and slighting, ventilating	inar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy perforculating 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 co systems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluation	Z,ZK rmance directive f description of init	The studen 3 or buildings tial conditior ing, heating n the aspec
125EABB Advanced course for Methodology of cal object survey and slighting, ventilating	inar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy perforculating 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 consystems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluation tection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is foc	Z,ZK rmance directive f description of init	The studen 3 or buildings tial conditior ing, heating n the aspec
diploma thesis sem 125EABB Advanced course for Methodology of cal object survey and sighting, ventilating of environment pro	inar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy performance of buildings, legislation. EPDB - 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 consystems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluation tection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is foctory resulting to presenting case study report about energy audit of existing building.	Z,ZK rmance directive f description of init nsumption - build on, evaluation fror used on the realis	The studen 3 for buildings tial conditior ing, heating in the aspectic buildings
diploma thesis sem 125EABB Advanced course for Methodology of cal object survey and sighting, ventilating of environment pro 125LTZB	Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - 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 consystems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluation tection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is foctor resulting to presenting case study report about energy audit of existing building. Laboratory of Building Services Systems	Z,ZK rmance directive f description of init nsumption - build on, evaluation fror used on the realis	The studen 3 For buildings tial condition ing, heating in the aspectic buildings
diploma thesis sem 125EABB Advanced course for Methodology of cal object survey and sighting, ventilating of environment pro 125LTZB	inar and the actual thesis. In the diploma seminar section, the student works with the data and backround information relating to the to consults the supervisor. Energy Audit of Buildings or introduction into energy auditing. Lectures topics: Energy audit and energy performance of buildings, legislation. EPDB - energy performance of buildings, legislation. EPDB - 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 consystems, technologies. Application of measures on a specific object. Synergic impact of energy saving measures. Economical evaluation tection. Evaluation - emission Individual object survey. Energy audit of industrial objects. Methods of buildings evaluation. Seminar is foctory resulting to presenting case study report about energy audit of existing building.	Z,ZK rmance directive f description of init nsumption - build on, evaluation fror used on the realis	3 for buildings tial condition ing, heating in the aspectic buildings
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125SPB1	Specialized design project 1	KZ	4
Design project is a	in independent subject for the students of Master degree study programme of Buildings and Environment. Students should prove deep	er knowledge c	oncerning the
	problem of building services systems.		
125SVKB	Seminar on Ventilation and Air-conditioning of Buildings	Z	2
	lops key topics in the field of HVAC in the form of exercises. It focuses on the practical steps of the design of these systems in various		
specific requirem	nents for ventilation, moisture control, heat load, etc. In the individual exercises, students will learn about the design of HVAC plant, fire	e ventilation, ass	essment of
	measures to limit noise and vibrations in the HVAC system, measurement and control, etc.		
125SYB	Building Systems	ZK	4
Multi-criteria analys	sis of the requirements for the indoor environment and the function of the systems in different types of buildings and plants and optimiz	ation criteria for	the design of
energy and ecologi	ical building systems. Relationships between building technical equipment and the building. Integrated view of conceptual solutions in di	fferent building	ypes in terms
=	and building design. E.g. office buildings, residential buildings, halls, shopping centres, cultural centres, industrial buildings, sports buil	-	-
etc. The audience v	will be introduced to the requirements for the indoor environment, the characteristic elements of energy and environmental building syste	ms in relation to	the structura
	design for the building type.		
125SZTC	Seminar on Heating and Cooling of Buildings	Z	2
Practical knowledge	e of the hydraulics of heating and cooling systems enables a deeper understanding of these issues and leads to better design of these sys	tems. It aims at u	understanding
	the practical use of design tools and programs for design in the field of heating and cooling of buildings.		
125TCHB	Technological Equipment of Buildings	ZK	3
Sauna, fireplaces, l	kitchen technology, elevators, technology swimming pools, heat pumps, heat source and technological system, technology cooling, fire	safety equipme	nt, sprinklers.
125VPTZ	Indoor Environment of Buildings	KZ	2
The course introdu	ces students to the basic knowledge of the aspects of indoor environmental quality of buildings. Both theoretical and practical fundame	entals of indoor	environmental
	issues will be discussed during the lectures.		
125VVKB	Heating Marting and Air Conditioning of Deliding		4
	Heating, ventilation and Air Conditioning of Buildings	ZK	4
	Heating, Ventilation and Air Conditioning of Buildings se in heating, ventilation and air conditioning of buildings focused on the integrated design and operation of technical systems for the p		-
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