

Study plan

Name of study plan: 18 159 NIBU 2012 bez odoru základ

Faculty/Institute/Others:

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

Required credits: 117

Elective courses credits: 3

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: 80

The role of the block: P

Code of the group: 12NI*1P-BOB

Name of the group: 2012 NIBU 1.sem povinné BEZ OBORU

Requirement credits in the group: In this group you have to gain 18 credits

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

Credits in the group: 18

Note on the group:

ASM14RPI není sepsán

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
124KPKP	Building Structures - Final Review Ctislav Fiala Ctislav Fiala Ctislav Fiala (Gar.)	ZK	4	3P	Z	P
2161108	Transport Phenomena Martin Barták Martin Barták Martin Barták (Gar.)	Z,ZK	4	2P+1C	*	P
A5M14RPI	Distribution of Electric Energy and Drives Jiří Lettl, Pavel Mindl, Jan Bauer Jiří Lettl Jiří Lettl (Gar.)	Z,ZK	5	2P+1L	Z	P
124ST1	Thermal Engineering in Construction 1 Jan Tywoniak Jan Tywoniak Jan Tywoniak (Gar.)	ZK	5	2P	Z	P

Characteristics of the courses of this group of Study Plan: Code=12NI*1P-BOB Name=2012 NIBU 1.sem povinné BEZ OBORU

124KPKP	Building Structures - Final Review	ZK	4	Basics of building structures. Functional requirements, structural systems, spatial effect of the structural system. Vertical load-bearing structures, floor structures, overhanging structures. Envelopes of buildings, windows, partitions, floors, suspended ceilings. Stairs, roof construction – timber roof trusses, roof envelopes. Foundation structures, structural solution of the substructure, waterproofing of the substructure. Structural systems of single and multi-storey buildings, structural systems of long-span structures.
2161108	Transport Phenomena	Z,ZK	4	Basics of transport phenomena for the study programme Intelligent Buildings. Momentum, heat and mass transport in built environment.
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5	
124ST1	Thermal Engineering in Construction 1	ZK	5	The subject discusses the basic chapters of building physics - part hygrothermal performance of buildings in an overview manner with the aim of providing basic information to students coming from non-construction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming from civil engineering.

Code of the group: 12NI*2P-BOB

Name of the group: 2012 NIBU 2.sem povinné BEZ OBORU

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 6 courses

Credits in the group: 26

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
125ESB	Buildings Ecology Systems Stanislav Frolík Stanislav Frolík Stanislav Frolík (Gar.)	KZ	4	2P	L	P
125EABI	Energy Audit of Building	KZ	4	2P	L	P
A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4	2P+1C	L	P
2161110	Air Conditioning and Industrial Ventilation František Drkal	Z,ZK	4	2P+1C	*	P
2163033	Design IB I. Jiří Bašta	Z	6	0P+4C	*	P
2161109	Automatic control in environmental engineering of building Jiří Bašta	Z,ZK	4	2P+1C	*	P

Characteristics of the courses of this group of Study Plan: Code=12NI*2P-BOB Name=2012 NIBU 2.sem povinné BEZ OBORU

125ESB	Buildings Ecology Systems	KZ	4	Principles of environmentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system design, pumping devices, water saving and special installations.		
125EABI	Energy Audit of Building	KZ	4	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.		
A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4	The course provides the student with a necessary overview of information technologies with attention paid to requirements of intelligent building information systems. Further on, the student learns the basic methods and techniques applicable to knowledge based systems aimed at automated solving of decision-making problems. The attention is paid namely to data and knowledge representation and its modeling so that the students are able to communicate effectively with IT and knowledge engineering experts. The students will also learn the basics of networking protocols used in intelligent buildings.		
2161110	Air Conditioning and Industrial Ventilation	Z,ZK	4	Main functional elements of ventilation and air conditioning systems. Air conditioning systems. Ventilation systems for residential and technological rooms.		
2163033	Design IB I.	Z	6	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.		
2161109	Automatic control in environmental engineering of building	Z,ZK	4	Application of basic approaches to automatic control of HVAC systems and equipments. Automatic control sequences of air conditioning and sources of heat.		

Code of the group: 12NI*3P-BOB

Name of the group: 2012 NIBU 3.sem povinné BEZ OBORU

Requirement credits in the group: In this group you have to gain 18 credits

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

Credits in the group: 18

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
2162700	Experimental Methods 1 Miroslav Kuera Miroslav Kuera Miroslav Kuera (Gar.)	KZ	4	0P+4L	*	P
2163034	Project IB II. Jiří Bašta Jiří Bašta (Gar.)	Z	6	0P+4C	*	P
2161102	Radiant and Industrial Heating Jiří Bašta, Jindřich Boháč Jiří Bašta Jiří Bašta (Gar.)	Z,ZK	4	2P+1C	*	P
A5M38SZS	Sensors and Networks Pavel Ripka, Antonín Platil Antonín Platil Pavel Ripka (Gar.)	Z,ZK	4	2P+1L	L	P

Characteristics of the courses of this group of Study Plan: Code=12NI*3P-BOB Name=2012 NIBU 3.sem povinné BEZ OBORU

2162700	Experimental Methods 1	KZ	4	Introduction study of experimental technique in environmental engineering		
2163034	Project IB II.	Z	6	Project and experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecologic investment.		
2161102	Radiant and Industrial Heating	Z,ZK	4	Student will be informed about the basics of radiant and other industrial heating systems		
A5M38SZS	Sensors and Networks	Z,ZK	4	Applications of sensors in buildings		

Code of the group: 12NI*4P-BOB

Name of the group: 2012 NIBU 4.sem povinné BEZ OBORU

Requirement credits in the group: In this group you have to gain 18 credits

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

Credits in the group: 18

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
2163086	Thesis Ji í Bašta Ji í Bašta Ji í Bašta (Gar.)	Z	26	0P+20C	*	P
A5M16FIP	Corporate finance Old ich Starý, Ji í Vaší ek, Blanka Ku erková Ji í Vaší ek Old ich Starý (Gar.)	KZ	4	3P+1C	L	P

Characteristics of the courses of this group of Study Plan: Code=12NI*4P-BOB Name=2012 NIBU 4.sem povinné BEZ OBORU

2163086	Thesis	Z	26	Thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.		
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 decision and net present value, IRR, comparison time period, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance, cash flow management. Dividend policy.		

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 37

The role of the block: PV

Code of the group: 12N**3Q--JV

Name of the group: 2012 N 3.sem povinná jazyková výuka

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

Requirement courses in the group: In this group you have to complete 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
2043081	English - Preparatory Course / FME Eliška Vítková, Ilona Šimice, Michaela Schusová, Veronika Kratochvílová Nina Procházková Ayyub	Z	2	0P+2C	*	PV
2043086	Czech - Preparatory Course Michaela Schusová, Petr Laurich, Hana Volejníková	Z	2	0P+2C	*	PV
2043083	French - Preparatory Course / FME Michaela Schusová Eliška Vítková	Z	2	0P+2C	*	PV
2043082	German - Lower Intermediate Course Eliška Vítková, Michaela Schusová, Petr Laurich, Jaroslava Kommová Jaroslava Kommová	Z	2	0P+2C	*	PV
2043085	Russian - Preparatory Course / FME Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská Eliška Vítková	Z	2	0P+2C	*	PV
2043084	Spanish - Preparatory Course / FME Eliška Vítková, Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková	Z	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12N**3Q--JV Name=2012 N 3.sem povinná jazyková výuka

2043081	English - Preparatory Course / FME	Z	2	Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.		
2043086	Czech - Preparatory Course	Z	2	Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
2043083	French - Preparatory Course / FME	Z	2	Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
2043082	German - Lower Intermediate Course	Z	2	Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.		

2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043084	Spanish - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			

Code of the group: 12N**3Q--JZ

Name of the group: 2012 N 3.sem povinná jazyková zkouška

Requirement credits in the group: In this group you have to gain 1 credit

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

Credits in the group: 1

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
2041081	English - Master Exam Eliška Vítková, Ilona Šimice, Michaela Schusová, Veronika Kratochvílová, Hana Volejníková, Nina Procházková Ayyub Nina Procházková Ayyub	ZK	1	0P+0C	*	PV
2041086	Czech- Master Exam Michaela Schusová, Petr Laurich	ZK	1	0P+0C	*	PV
2041083	French - Master Exam / FME Eliška Vítková, Michaela Schusová, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	ZK	1	0P+0C	*	PV
2041082	German - Master Exam / FME Eliška Vítková, Michaela Schusová, Petr Laurich, Jaroslava Kommová Jaroslava Kommová	ZK	1	0P+0C	*	PV
2041085	Russian - Master Exam / FME Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská, Petr Zítka Eliška Vítková	ZK	1	0P+0C	*	PV
2041084	Spanish - Master Exam / FME Eliška Vítková, Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková	ZK	1	0P+0C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12N**3Q--JZ Name=2012 N 3.sem povinná jazyková zkouška

2041081	English - Master Exam	ZK	1
Mapped to the level of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2041086	Czech- Master Exam	ZK	1
2041083	French - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.			
2041082	German - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.			
2041085	Russian - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.			
2041084	Spanish - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.			

Code of the group: 12NI*1Q-BOB

Name of the group: 2012 NIBU 1.sem 3povol BEZ OBORU

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

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 12

Note on the group:

A5M35MAS je pro jiný stud. program

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
A5M15ES1	Electrical Light 1 Petr Žák, Petr Žák	KZ	4	2P+1S	Z	PV
125EIBB	Electroengineering and intelligent buildings Bohumír Garlík Bohumír Garlík Bohumír Garlík (Gar.)	KZ	4	2P	Z	PV
124INBB	Integrated Design of Buildings Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.)	Z,ZK	4	2P+1C	Z	PV

A5M38MEB	Measurements in the Buildings <i>Petr Kašpar Petr Kašpar Petr Kašpar (Gar.)</i>	KZ	4	2P+1L	Z	PV
A5M35MAS	Modeling and simulation	KZ	4	2P+2C	Z	PV
125MEC	Simulation of Building Energy Performance <i>Karel Kabele, Miroslav Urban Karel Kabele Karel Kabele (Gar.)</i>	KZ	4	1P+1C	Z	PV
124OSIB	Lighting and Acoustics <i>Jaroslav Vychytil, Lenka Maierová Jaroslav Vychytil Jaroslav Vychytil (Gar.)</i>	KZ	4	2P	Z	PV
2152038	Energy Sources and Conversions	KZ	4	3P+1C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NI*1Q-BOB Name=2012 NIBU 1.sem 3povvol BEZ OBORU

A5M15ES1	Electrical Light 1	KZ	4
125EIBB	Electroengineering and intelligent buildings The information society, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental idea is to save energy, materials and ensure optimal indoor and outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intelligent devices in buildings requires a system approach to solve the whole complex of HVAC and intelligent wiring.	KZ	4
124INBB	Integrated Design of Buildings 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.	Z,ZK	4
A5M38MEB	Measurements in the Buildings The students will learn about principles of measurement of basic physical quantities in the building. As the majority of the physical quantities are converted to the electrical 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 measurement and Sensors and transducers on CTU FEE.	KZ	4
A5M35MAS	Modeling and simulation	KZ	4
125MEC	Simulation of Building Energy Performance The course is aimed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of tools and methodologies for solving these problems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, construction and other factors affecting building behaviour. The aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating building energy behaviour.	KZ	4
124OSIB	Lighting and Acoustics The course introduces students to the basics of building lighting technology and building acoustics and deepens further knowledge.	KZ	4
2152038	Energy Sources and Conversions	KZ	4

Code of the group: 12NI*2Q-BOB

Name of the group: 2012 NIBU 2.sem 1povvol BEZ OBORU

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

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

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
A5M02AKA	Acoustic Applications <i>Ondřej Jířek Ondřej Jířek Ondřej Jířek (Gar.)</i>	KZ	4	2P+2L	L	PV
2162035	Alternative Energy Sources <i>Tomáš Matuška</i>	KZ	4	2P+1C	*	PV
A5M34ELE	Electronics <i>Alexandr Laposa, Adam Bou a Alexandr Laposa Alexandr Laposa (Gar.)</i>	KZ	4	3P+1L	L	PV
125OZEB	Renewable Energy Sources <i>Michal Kabrhel Michal Kabrhel Michal Kabrhel (Gar.)</i>	ZK	4	2P	L	PV
125PBZB	Fire Services <i>Bohumír Garlík, Ilona Koubková, Pavla Hofbauer Pechová Ilona Koubková Ilona Koubková (Gar.)</i>	KZ	4	2P	L	PV
A5M38SPD	Collection and data transfer <i>Pavel Mlejnek</i>	KZ	4	3P+1L	L	PV
2162114	Heating <i>Jiří Bašta</i>	KZ	4	2P+1C	*	PV
2162115	Ventilation and Air Conditioning <i>Vladimír Zmrhal</i>	KZ	4	2P+1C	*	PV
A5M14ZSE	Fundamentals of Power Electrical Engineering	KZ	4	2+1L	L	PV

Characteristics of the courses of this group of Study Plan: Code=12NI*2Q-BOB Name=2012 NIBU 2.sem 1povvol BEZ OBORU

A5M02AKA	Acoustic Applications Lecture summarize applications in physical acoustics, room and building acoustics, environmental acoustics, noise and vibration control, physiological acoustics, diagnostics, and ultrasound.	KZ	4
2162035	Alternative Energy Sources Principles and basics of alternative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization.	KZ	4
A5M34ELE	Electronics	KZ	4

125OZEB	Renewable Energy Sources	ZK	4
The course deals with renewable energy sources and building energy systems. The different types of energy-solar, wind, biomass, geothermal and hydro-are discussed in detail. The characteristics of the energies and the most appropriate methods of use are described. Attention is paid to understanding the correct way to design facilities and systems that use renewable energy sources.			
125PBZB	Fire Services	KZ	4
Fire water,hydrant systems,fire pipe,fire station.Fixed fire-fighting water with water mist, foam, and halon. Special fire-fighting equipment.Protecting buildings against fire spread from technological equipment.Electric fire alarm. Fire control equipment. Backup power source.			
A5M38SPD	Collection and data transfer	KZ	4
2162114	Heating	KZ	4
Supplemented knowledge from heating of residential and industrial buildings. Designing of convective and radiant heating systems.			
2162115	Ventilation and Air Conditioning	KZ	4
Main principles of ventilation and air conditioning. Source materials for design of systems. Natural ventilation, forced ventilation, air conditioning systems - output (capacity)and operation.			
A5M14ZSE	Fundamentals of Power Electrical Engineering	KZ	4

Code of the group: 12NI*3Q-BOB

Name of the group: 2012 NIBU 3.sem 3povvol BEZ OBORU

Requirement credits in the group: In this group you have to gain 18 credits

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

Credits in the group: 18

Note on the group:

A5M38EMC NENÍ SEPSÁN

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
2152060	Refrigeration Technique and Heat Pumps for Intelligent Buildings	KZ	4	3P+1C	*	PV
A5M16EUE	Economics of Energy Use Ji í Beranovský Ji í Beranovský Ji í Beranovský (Gar.)	KZ	4	3P+1C	Z	PV
A5M34EZS	Electronic security systems Miroslav Husák, Jan Novák, Tomáš Teplý Miroslav Husák Miroslav Husák (Gar.)	KZ	4	3P+1L	Z	PV
A5M13FVS	Photovoltaic Systems Pavel Hrzina, Ladislava erná, Vít zslav Benda Ladislava erná Pavel Hrzina (Gar.)	KZ	4	2P+2L	Z	PV
A5M13NZZ	Independent sources Václav Papež Václav Papež Václav Papež (Gar.)	KZ	4	3P+1L	Z	PV
2162064	Noise and Vibration Control Miroslav Ku era, Richard Nový Miroslav Ku era Miroslav Ku era (Gar.)	KZ	4	2P+1C	*	PV
125SYB	Building Systems Jan Tywoniak, Karel Kabele Karel Kabele Karel Kabele (Gar.)	ZK	4	4P	Z	PV
125TECE	Technological Units Ilona Koubková Ilona Koubková Ilona Koubková (Gar.)	KZ	4	2P	Z	PV

Characteristics of the courses of this group of Study Plan: Code=12NI*3Q-BOB Name=2012 NIBU 3.sem 3povvol BEZ OBORU

2152060	Refrigeration Technique and Heat Pumps for Intelligent Buildings	KZ	4
A5M16EUE	Economics of Energy Use Organization and energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characterization of aggregate, secondary energy sources. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial analysis.	KZ	4
A5M34EZS	Electronic security systems	KZ	4
A5M13FVS	Photovoltaic Systems Solar energy and its exploitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (construction, technology, parameters). Photovoltaic systems (including energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and ecological aspects, present trends.	KZ	4
A5M13NZZ	Independent sources Electrochemical sources of the electric power - overview. Electrochemical sources (accumulators), applications. Uninterruptible power sources in IB. Other sources of the electrical energy. Perspective sources of electrical enegy, storage of energy.	KZ	4
2162064	Noise and Vibration Control Student will be informed about the basic acoustic dimensions, which are important for evaluation of noise.	KZ	4
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.	ZK	4
125TECE	Technological Units Saunas, fireplaces, kitchen technology, elevators, heat pumps, technology, swimming pools, heat source and technological systems.	KZ	4

List of courses of this pass:

Code	Name of the course	Completion	Credits
124INBB	Integrated Design of Buildings 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.	Z,ZK	4
124KPKP	Building Structures - Final Review Basics of building structures. Functional requirements, structural systems, spatial effect of the structural system. Vertical load-bearing structures, floor structures, overhanging structures. Envelopes of buildings, windows, partitions, floors, suspended ceilings. Stairs, roof construction – timber roof trusses, roof envelopes. Foundation structures, structural solution of the substructure, waterproofing of the substructure. Structural systems of single and multi-storey buildings, structural systems of long-span structures.	ZK	4
124OSIB	Lighting and Acoustics The course introduces students to the basics of building lighting technology and building acoustics and deepens further knowledge.	KZ	4
124ST1	Thermal Engineering in Construction 1 The subject discusses the basic chapters of building physics - part hygrothermal performance of buildings in an overview manner with the aim of providing basic information to students coming from non-construction bachelor's fields and at the same time supplementing knowledge and linking it with contexts for students coming from civil engineering.	ZK	5
125EABI	Energy Audit of Building 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.	KZ	4
125EIBB	Electroengineering and intelligent buildings The information society, intelligent systems, new technologies significantly influence various HVAC system applications. The fundamental idea is to save energy, materials and ensure optimal indoor and outdoor environmental parameters. The influence of electromagnetic environment, electromagnetic compatibility, application of intelligent devices in buildings requires a system approach to solve the whole complex of HVAC and intelligent wiring.	KZ	4
125ESB	Buildings Ecology Systems Principles of environmentally friendly water management. Disposal of sewage water and use of rain water. Measurement of water consumption, system design, pumping devices, water saving and special installations.	KZ	4
125MEC	Simulation of Building Energy Performance The course is aimed at explaining the issues of modelling and simulation of energy behaviour of buildings. Students will be introduced to an overview of tools and methodologies for solving these problems and learn how to use the simulation software DesignBuilder. In addition, they will be introduced to climate data, materials, construction and other factors affecting building behaviour. The aim of the course is to provide students with basic knowledge and practical experience in modelling and simulating building energy behaviour.	KZ	4
125OZEB	Renewable Energy Sources 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.	ZK	4
125PBZB	Fire Services Fire water,hydrant systems,fire pipe,fire station.Fixed fire-fighting water with water mist, foam, and halon. Special fire-fighting equipment.Protecting buildings against fire spread from technological equipment.Electric fire alarm. Fire control equipment. Backup power source.	KZ	4
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.	ZK	4
125TECE	Technological Units Saunas, fireplaces, kitchen technology, elevators, heat pumps, technology, swimming pools, heat source and technological systems.	KZ	4
2041081	English - Master Exam Mapped to the level of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	ZK	1
2041082	German - Master Exam / FME Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	ZK	1
2041083	French - Master Exam / FME Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	ZK	1
2041084	Spanish - Master Exam / FME Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	ZK	1
2041085	Russian - Master Exam / FME Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	ZK	1
2041086	Czech- Master Exam	ZK	1
2043081	English - Preparatory Course / FME Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.	Z	2

2043082	German - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043083	French - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043084	Spanish - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043086	Czech - Preparatory Course	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2152038	Energy Sources and Conversions	KZ	4
2152060	Refrigeration Technique and Heat Pumps for Intelligent Buildings	KZ	4
2161102	Radiant and Industrial Heating	Z,ZK	4
Student will be informed about the basics of radiant and other industrial heating systems			
2161108	Transport Phenomena	Z,ZK	4
Basics of transport phenomena 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 approaches to automatic control of HVAC systems and equipments. Automatic control sequences of air conditioning and sources of heat.			
2161110	Air Conditioning and Industrial Ventilation	Z,ZK	4
Main functional elements of ventilation and air conditioning systems. Air conditioning systems. Ventilation systems for residential and technological rooms.			
2162035	Alternative Energy Sources	KZ	4
Principles and basics of alternative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization.			
2162064	Noise and Vibration Control	KZ	4
Student will be informed about the basic acoustic dimensions, which are important for evaluation of noise.			
2162114	Heating	KZ	4
Supplemented knowledge from heating of residential and industrial buildings. Designing of convective and radiant heating systems.			
2162115	Ventilation and Air Conditioning	KZ	4
Main principles of ventilation and air conditioning. Source materials for design of systems. Natural ventilation, forced ventilation, air conditioning systems - output (capacity) and operation.			
2162700	Experimental Methods 1	KZ	4
Introduction study of experimental technique in environmental engineering			
2163033	Design IB I.	Z	6
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.			
2163034	Project IB II.	Z	6
Project and experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecologic investment.			
2163086	Thesis	Z	26
Thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
A5M02AKA	Acoustic Applications	KZ	4
Lecture summarize applications in physical acoustics, room and building acoustics, environmental acoustics, noise and vibration control, physiological acoustics, diagnostics, and ultrasound.			
A5M13FVS	Photovoltaic Systems	KZ	4
Solar energy and its exploitation using photovoltaic systems. Photovoltaic phenomena, solar cells and their characteristics, solar modules (construction, technology, parameters). Photovoltaic systems (including energy conservation). Photovoltaic system applications, optimisation of operating conditions. Basic economical and ecological aspects, present trends.			
A5M13NZZ	Independent sources	KZ	4
Electrochemical sources of the electric power - overview. Electrochemical sources (accumulators), applications. Uninterruptible power sources in IB. Other sources of the electrical energy. Perspective sources of electrical energy, storage of energy.			
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5
A5M14ZSE	Fundamentals of Power Electrical Engineering	KZ	4
A5M15ES1	Electrical Light 1	KZ	4
A5M16EUE	Economics of Energy Use	KZ	4
Organization and energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characterization of aggregate, secondary energy sources. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial analysis.			
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 decision and net present value, IRR, comparison time period, annual equivalent value, inflation and return, capital asset pricing model, portfolio, sensitivity analysis and risk, short term finance, cash flow management. Dividend policy.			
A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4
The course provides the student with a necessary overview of information technologies with attention paid to requirements of intelligent building information systems. Further on, the student learns the basic methods and techniques applicable to knowledge based systems aimed at automated solving of decision-making problems. The attention is paid namely to data and knowledge representation and its modeling so that the students are able to communicate effectively with IT and knowledge engineering experts. The students will also learn the basics of networking protocols used in intelligent buildings.			
A5M34ELE	Electronics	KZ	4
A5M34Ezs	Electronic security systems	KZ	4

A5M35MAS	Modeling and simulation	KZ	4
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 converted to the electrical 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 measurement and Sensors and transducers on CTU FEE.			
A5M38SPD	Collection and data transfer	KZ	4
A5M38SZS	Sensors and Networks Applications of sensors in buildings	Z,ZK	4

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