

Study plan

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

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: No Special Fields of Study

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 Tywniak Jan Tywniak (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
2161108	Transport Phenomena Basics of transport phenomena for the study programme Intelligent Buildings. Momentum, heat and mass transport in built environment.	Z,ZK	4
A5M14RPI	Distribution of Electric Energy and Drives	Z,ZK	5
124ST1	Thermal Engineering in Construction 1	ZK	5

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 Ilona Koubková, Stanislav Frolík, Hana Kabrhelová Hana Kabrhelová Stanislav Frolík (Gar.)	KZ	4	2P	L	P
125EABI	Energy Audit of Building Hana Kabrhelová	KZ	4	2P	L	P

A5M33IZS	Information and Knowledge-Based Systems	Z,ZK	4	2P+1C	L	P
2161110	Air Conditioning and Industrial Ventilation <i>Miloš Lain</i>	Z,ZK	4	2P+1C	*	P
2163033	Design IB I. <i>Martin Barták, Jiří Bašta, Jindřich Boháč, Jiří Hemerka, Miroslav Kuera, Miloš Lain, Tomáš Matuška, Roman Vavřík, Pavel Vybíral, Jiří Bašta Jiří Bašta (Gar.)</i>	Z	6	0P+4C	*	P
2161109	Automatic control in environmental engineering of building <i>Jiří Bašta, Jindřich Boháč Jiří Bašta Jiří Bašta (Gar.)</i>	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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2162700	Experimental Methods 1 <i>Miroslav Kuera Miroslav Kuera Miroslav Kuera (Gar.)</i>	KZ	4	0P+4L	*	P
2163034	Project IB II. <i>Jiří Bašta Jiří Bašta (Gar.)</i>	Z	6	0P+4C	*	P
2161102	Radiant and Industrial Heating <i>Jiří Bašta, Jindřich Boháč Jiří Bašta Jiří Bašta (Gar.)</i>	Z,ZK	4	2P+1C	*	P
A5M38SZS	Sensors and Networks <i>Antonín Platil, Pavel Ripka Antonín Platil Pavel Ripka (Gar.)</i>	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 Jiří Bašta, Vladimír Šulc Tomáš Matuška Jiří Bašta (Gar.)	Z	26	0P+20C	*	P
A5M16FIP	Corporate finance Oldřich Starý, Jiří Vašíček, Blanka Kučerová Oldřich 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, Zuzana Kalinová, Michaela Schusová, Veronika Kratochvílová, Hana Volejníková, Nina Procházková Ayyub Nina Procházková Ayyub	Z	2	0P+2C	*	PV
2043086	Czech - Preparatory Course Eliška Vítková, Petr Laurich, Jaroslava Kommová Jaroslava Kommová	Z	2	0P+2C	*	PV
2043083	French - Preparatory Course / FME Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	Z	2	0P+2C	*	PV
2043082	German - Preparatory Course / FME Eliška Vítková, Petr Laurich, Jaroslava Kommová Jaroslava Kommová	Z	2	0P+2C	*	PV
2043085	Russian - Preparatory Course / FME Eliška Vítková, Hana Volejníková, Dušana Jirovská Eliška Vítková	Z	2	0P+2C	*	PV
2043084	Spanish - Preparatory Course / FME Eliška Vítková, Jaime Andrés Villagómez Jaime Andrés Villagómez	Z	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12N3Q--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			
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 - 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.						
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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2041081	English - Master Exam <i>Eva Pavlincová, Eliška Vítková, Ilona Šimice, Eva Kon elíková, Zuzana Kalinová, Michaela Schusová, Veronika Kratochvílová, Hana Volejníková, Nina Procházková Ayyub Nina Procházková Ayyub</i>	ZK	1	0P+0C	*	PV
2041086	Czech- Master Exam <i>Eliška Vítková, Petr Laurich, Jaroslava Kommová Jaroslava Kommová</i>	ZK	1	0P+0C	*	PV
2041083	French - Master Exam / FME <i>Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)</i>	ZK	1	0P+0C	*	PV
2041082	German - Master Exam / FME <i>Eliška Vítková, Petr Laurich, Jaroslava Kommová Jaroslava Kommová</i>	ZK	1	0P+0C	*	PV
2041085	Russian - Master Exam / FME <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská, Petr Zitko Eliška Vítková</i>	ZK	1	0P+0C	*	PV
2041084	Spanish - Master Exam / FME <i>Eliška Vítková, Jaime Andrés Villagómez Jaime Andrés Villagómez</i>	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 3povvol 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
A5M15ES1	Electrical Light 1 <i>Petr Žák Petr Žák</i>	KZ	4	2P+1S	Z	PV
125EIBB	Electroengineering and intelligent buildings <i>Ilona Koubková, Stanislav Frolík, Hana Kabrhelová, Bohumír Garlík, Karel Kabele Bohumír Garlík Bohumír Garlík (Gar.)</i>	KZ	4	2P	Z	PV
124INBB	Integrated Design of Buildings <i>Petr Hájek, Antonín Lupíšek Antonín Lupíšek Petr Hájek (Gar.)</i>	Z,ZK	4	2P+1C		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>Ilona Koubková, Stanislav Frolík, Hana Kabrhelová, Karel Kabele Hana Kabrhelová 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			
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125EIBB	Electroengineering and intelligent buildings	KZ	4
Construction of intelligent buildings (IB) is founded on mathematical-physical principles and draws from various definitions of IB. The information society, intelligent systems, new technologies, and nanotechnologies have significant impact on various system applications of technical equipment of buildings. The underlying idea is mainly energy and material saving and provision of the optimum parameters of indoor and outdoor environment. A new field rises, focused on user oriented building industry. Influence of electromagnetic environment, electromagnetic compatibility, implementation of intelligently operating equipment in buildings requires a systemic approach to solution of the whole complex of technical equipment of buildings. To let the students have a good grasp on new solutions within technical equipment of buildings and construction of IB, this subject aims to present a general view of such solutions. In a transparent form via examples, description of existing and future IB solutions, explanation of logical systems, including logical PLC control and IRC control of building on the room level, communications and implementation of fuzzy control shall be provided. New installation of LonWorks networks inside the building shall be described, same as intelligent ABB i-bus and KNX/EIB wiring, aimed at energy saving. The final part of the lectures shall concentrate on electronic access control and fire alarm security systems within the integrated control system.			
124INBB	Integrated Design of Buildings	Z,ZK	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.			
A5M35MAS	Modeling and simulation	KZ	4
125MEC	Simulation of Building Energy Performance	KZ	4
Introductory course for modelling and simulation of building energy performance.			
124OSIB	Lighting and Acoustics	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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
A5M02AKA	Acoustic Applications <i>Ond ej Ji í ek Ond ej Ji í ek Ond ej Ji í ek (Gar.)</i>	KZ	4	2P+2L	L	PV
2162035	Alternative Energy Sources <i>Tomáš Matuška Tomáš Matuška Tomáš Matuška (Gar.)</i>	KZ	4	2P+1C	*	PV
A5M34ELE	Electronics <i>Adam Bou a, Vít Záhlava Adam Bou a Adam Bou a (Gar.)</i>	KZ	4	3P+1L	L	PV
125OZEB	Renewable Energy Sources <i>Ilona Koubková, Stanislav Frolík, Hana Kabrhelová, Karel Kabele, Michal Kabrhel Hana Kabrhelová Michal Kabrhel (Gar.)</i>	ZK	4	2P	L	PV
125PBZB	Fire Services <i>Ilona Koubková, Stanislav Frolík, Hana Kabrhelová, Bohumír Garlík, Karel Kabele, Karel Papež Hana Kabrhelová Ilona Koubková (Gar.)</i>	KZ	4	2P	L	PV
A5M38SPD	Collection and data transfer <i>Pavel Mlejnek Pavel Mlejnek Pavel Mlejnek (Gar.)</i>	KZ	4	3P+1L	L	PV
124ST2	Thermal Engineering 2 <i>Jan Tywoniak</i>	KZ	4	2P		PV
2162114	Heating <i>Ji í 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	KZ	4
Lecture summarize applications in physical acoustics, room and building acoustics, environmental acoustics, noise and vibration control, physiological acoustics, diagnostics, and ultrasound.			
2162035	Alternative Energy Sources	KZ	4
Principles and basics of alternative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization.			
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 proper 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
124ST2	Thermal Engineering 2	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 Miroslav Husák (Gar.)	KZ	4	3P+1L	Z	PV
A5M13FVS	Photovoltaic Systems Jakub Holovský, Ladislava erná, Vít zslav Benda Jakub Holovský Jakub Holovský (Gar.)	KZ	4	3P+1L	Z	PV
A5M13NZZ	Independent sources 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 Tywoniák, Stanislav Frolík, Hana Kabrhelová, Karel Kabele, Roman Musil Hana Kabrhelová Karel Kabele (Gar.)	ZK	4	4P	Z	PV
125TECE	Technological Units Ilona Koubková, Stanislav Frolík, Hana Kabrhelová, Karel Kabele Hana Kabrhelová 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 energy, 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	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	Z,ZK	4
124KPKP	Building Structures - Final Review	ZK	4
124OSIB	Lighting and Acoustics	KZ	4
124ST1	Thermal Engineering in Construction 1	ZK	5
124ST2	Thermal Engineering 2	KZ	4
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.

125EIBB	Electroengineering and intelligent buildings Construction of intelligent buildings (IB) is founded on mathematical-physical principles and draws from various definitions of IB. The information society, intelligent systems, new technologies, and nanotechnologies have significant impact on various system applications of technical equipment of buildings. The underlying idea is mainly energy and material saving and provision of the optimum parameters of indoor and outdoor environment. A new field rises, focused on user oriented building industry. Influence of electromagnetic environment, electromagnetic compatibility, implementation of intelligently operating equipment in buildings requires a systemic approach to solution of the whole complex of technical equipment of buildings. To let the students have a good grasp on new solutions within technical equipment of buildings and construction of IB, this subject aims to present a general view of such solutions. In a transparent form via examples, description of existing and future IB solutions, explanation of logical systems, including logical PLC control and IRC control of building on the room level, communications and implementation of fuzzy control shall be provided. New installation of LonWorks networks inside the building shall be described, same as intelligent ABB i-bus and KNX/EIB wiring, aimed at energy saving. The final part of the lectures shall concentrate on electronic access control and fire alarm security systems within the integrated control system.	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 Introductory course for modelling and simulation of building energy performance.	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 proper 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	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 - 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.	Z	2
2043083	French - 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.	Z	2
2043084	Spanish - 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.	Z	2
2043085	Russian - 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.	Z	2
2043086	Czech - Preparatory Course	Z	2
2152038	Energy Sources and Conversions	KZ	4
2152060	Refrigeration Technique and Heat Pumps for Intelligent Buildings	KZ	4
2161102	Radiant and Industrial Heating Student will be informed about the basics of radiant and other industrial heating systems	Z,ZK	4
2161108	Transport Phenomena Basics of transport phenomena for the study programme Intelligent Buildings. Momentum, heat and mass transport in built environment.	Z,ZK	4
2161109	Automatic control in environmental engineering of building Application of basic approaches to automatic control of HVAC systems and equipments. Automatic control sequences of air conditioning and sources of heat.	Z,ZK	4
2161110	Air Conditioning and Industrial Ventilation Main functional elements of ventilation and air conditioning systems. Air conditioning systems. Ventilation systems for residential and technological rooms.	Z,ZK	4

2162035	Alternative Energy Sources Principles and basics of alternative energy sources use in buildings. Solar energy. Heat pumps. Biomass utilization.	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
2162114	Heating Supplemented knowledge from heating of residential and industrial buildings. Designing of convective and radiant heating systems.	KZ	4
2162115	Ventilation and Air Conditioning Main principles of ventilation and air conditioning. Source materials for design of systems. Natural ventilation, forced ventilation, air conditioning systems - output (capacity) and operation.	KZ	4
2162700	Experimental Methods 1 Introduction study of experimental technique in environmental engineering	KZ	4
2163033	Design IB I. Design of heating systems, heat distributors and systems for using recoverable source of energy. Design of ventilation and air conditioning systems, including gas cleaning and reduction of noise.	Z	6
2163034	Project IB II. Project and experimental solution of environmental devices. Optimization investment and operating costs, economic appraisal of ecologic investment.	Z	6
2163086	Thesis 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.	Z	26
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
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 energy, storage of energy.	KZ	4
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 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
A5M16FIP	Corporate finance 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.	KZ	4
A5M33IZS	Information and Knowledge-Based Systems 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.	Z,ZK	4
A5M34ELE	Electronics	KZ	4
A5M34EZS	Electronic security systems	KZ	4
A5M35MAS	Modeling and simulation	KZ	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
A5M38SPD	Collection and data transfer	KZ	4
A5M38SZS	Sensors and Networks Applications of sensors in buildings	Z,ZK	4

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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