

# Doporučený průchod studijním plánem

## Název průchodu: Bachelor Branch Computer Science, in English, Version 201 - 2019

Fakulta: Fakulta informačních technologií

Katedra: katedra teoretické informatiky

Průchod studijním plánem: Bc. Branch Computer Science, Presented in English, Version 2015 to 2019

Obor studia, garantovaný katedrou: Computer Science (Bachelor, in English)

Garant oboru studia: doc. Ing. Jan Janoušek, Ph.D.

Program studia: Informatics (in English)

Typ studia: Bakalářské prezenční

Poznámka k průchodu:

Kódování rolí předmětů a skupin předmětů:

P - povinné předměty programu, PO - povinné předměty oboru, Z - povinné předměty, S - povinně volitelné předměty, PV - povinně volitelné předměty, F - volitelné předměty odborné, V - volitelné předměty, T - tělovýchovné předměty

Kódování způsobů zakončení předmětů (KZ/Z/ZK) a zkratk semestrů (Z/L):

KZ - klasifikovaný zápočet, Z - zápočet, ZK - zkouška, L - letní semestr, Z - zimní semestr

### Číslo semestru: 1

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejích členů) Vyučující, autoři a garanti (gar.)	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-CAO	<b>Digital and Analog Circuits</b> Kateřina Hyniová <b>Miroslav Balík</b> Kateřina Hyniová (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-ZMA	<b>Elements of Calculus</b> Antonella Marchesiello <b>Tomáš Kalvoda</b> Tomáš Kalvoda (Gar.)	Z,ZK	6	3P+2C	Z	PP
BIE-PAI	<b>Law and Informatics</b> Alžběta Krausová, Martin Myška, Michal Matějka, Zdeněk Kučera <b>Miroslav Balík</b> Zdeněk Kučera (Gar.)	ZK	3	2P	Z	PP
BIE-MLO	<b>Mathematical Logic</b> Kateřina Trlířajová, Jiřka Rybničková Kateřina Trlířajová (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-PA1	<b>Programming and Algorithmics 1</b> Ladislav Vagner, Jan Trávníček, Miroslav Balík, Josef Vogel <b>Jan Trávníček</b> Ladislav Vagner (Gar.)	Z,ZK	6	2P+2R+2C	Z	PP
BIE-PS1	<b>Programming in Shell 1</b> Jan Trdlička <b>Jan Trdlička</b> (Gar.)	KZ	5	2P+2C	Z	PP

### Číslo semestru: 2

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejích členů) Vyučující, autoři a garanti (gar.)	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-SAP	<b>Computer Structures and Architectures</b> Jiří Douša, Petr Fišer, Pavel Kubalík <b>Petr Fišer</b> Jiří Douša (Gar.)	Z,ZK	6	2P+1R+2C	L	PP
BIE-DBS	<b>Database Systems</b> Josef Pavlíček, Yelena Trofimova <b>Miroslav Balík</b> Josef Pavlíček (Gar.)	Z,ZK	6	3L	Z,L	PP
BIE-LIN	<b>Linear Algebra</b> Pavel Hrabák Karel Klouda (Gar.)	Z,ZK	7	4P+2C	L	PP
BIE-PA2	<b>Programming and Algorithmics 2</b> Ladislav Vagner, Jan Trávníček, Josef Vogel <b>Jan Trávníček</b> Ladislav Vagner (Gar.)	Z,ZK	7	2P+1R+1C	L	PP
BIE-V.2017	<b>Purely Elective Bachelor Courses, Version 2017</b> BIE-ZUM,BIE-ZRS,..... (pokračování viz seznam skupin níže)	Min. předm. 0	Min/Max 0/22			V

### Číslo semestru: 3

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejích členů) Vyučující, autoři a garanti (gar.)	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-AG1	<b>Algorithms and Graphs 1</b> Jiřina Scholtzová, Pavel Tvrđík <b>Pavel Tvrđík</b> Pavel Tvrđík (Gar.)	Z,ZK	6	2P+2C	Z	PP
BIE-AAG	<b>Automata and Grammars</b> Jan Trávníček, Jan Holub, Jan Janoušek, Martin Svoboda, Ondřej Guth <b>Radomír Polách</b> Jan Holub (Gar.)	Z,ZK	6	2P+2C	Z	PP
BIE-ZDM	<b>Elements of Discrete Mathematics</b> Josef Kolář <b>Miroslav Balík</b> Josef Kolář (Gar.)	Z,ZK	5	2P+2C	Z	PP

BIE-SI1.2	<b>Software Engineering I</b> <i>Zdeněk Rybala Zdeněk Rybala Zdeněk Rybala (Gar.)</i>	Z,ZK	5	2P+1C	Z,L	PP
BIE-EMP	<b>Economic and management principles</b> <i>Tomáš Evan Tomáš Evan (Gar.)</i>	KZ	4	2P+2C	Z	PE
BIE-V.2017	<b>Purely Elective Bachelor Courses, Version 2017</b> <i>BIE-ZUM,BIE-ZRS,..... (pokračování viz seznam skupin níže)</i>	Min. předm. 0	Min/Max 0/22			V

#### Číslo semestru: 4

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejich členů) <i>Vyučující, autoři a garanti (gar.)</i>	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-PSI	<b>Computer Networks</b> <i>Yelena Trofimova, Vladimír Smotlacha Alexandru Moucha Vladimír Smotlacha (Gar.)</i>	Z,ZK	5	2P+1R+1C	L	PP
BIE-OSY	<b>Operating Systems</b> <i>Pavel Tvrdlík, Michal Štepanovský Pavel Tvrdlík (Gar.)</i>	Z,ZK	5	2P+1R+1L	L	PP
BIE-BEZ	<b>Security</b> <i>Róbert Lórencz, Jiří Buček Róbert Lórencz (Gar.)</i>	Z,ZK	6	2P+1R+1C	L	PP
BIE-AG2	<b>Algorithms and Graphs 2</b> <i>Jiřina Scholtzová Jiřina Scholtzová Jiřina Scholtzová (Gar.)</i>	Z,ZK	5	2P+2C	L	PO
BIE-PJP	<b>Programming Languages and Compilers</b> <i>Jan Trávníček, Radomír Polách Radomír Polách Jan Janoušek (Gar.)</i>	Z,ZK	5	2P+1C	L	PO
BIE-V.2017	<b>Purely Elective Bachelor Courses, Version 2017</b> <i>BIE-ZUM,BIE-ZRS,..... (pokračování viz seznam skupin níže)</i>	Min. předm. 0	Min/Max 0/22			V

#### Číslo semestru: 5

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejich členů) <i>Vyučující, autoři a garanti (gar.)</i>	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-BPR	<b>Bachelor Project</b> <i>Dana Vynikarová</i>	Z	2		Z	PP
BIE-PST	<b>Probability and Statistics</b> <i>Petr Novák Petr Novák (Gar.)</i>	Z,ZK	5	2P+1R+1C	Z	PP
BIE-APS.1	<b>Architectures of Computer Systems</b> <i>Pavel Tvrdlík, Michal Štepanovský Jiří Buček Pavel Tvrdlík (Gar.)</i>	Z,ZK	5	2P+2C	Z	PO
BIE-VZD	<b>Data Mining</b> <i>Juan Pablo Maldonado Lopez, Kamil Dedecius Pavel Kordík Pavel Kordík (Gar.)</i>	Z,ZK	4	2P+2C	Z	PO
BIE-OOP	<b>Object-Oriented Programming</b> <i>Stéphane Ducasse, Robert Pergl, Filip Křikava, Jan Blizničenko Robert Pergl Robert Pergl (Gar.)</i>	Z,ZK	4	2P+2C	Z	PO
BIE-PPA	<b>Programming Paradigms</b> <i>Tomáš Pecka, Jan Janoušek, Radomír Polách, Petr Máj Petr Máj Petr Máj (Gar.)</i>	Z,ZK	5	2P+2C	Z	PO
BIE-V.2017	<b>Purely Elective Bachelor Courses, Version 2017</b> <i>BIE-ZUM,BIE-ZRS,..... (pokračování viz seznam skupin níže)</i>	Min. předm. 0	Min/Max 0/22			V

#### Číslo semestru: 6

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejich členů) <i>Vyučující, autoři a garanti (gar.)</i>	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-BAP	<b>Bachelor Thesis</b> <i>Miroslav Balík</i>	Z	14		L,Z	PP
BIE-DPR	<b>Documentation, Presentation, Rhetorics</b> <i>Ondřej Guth, Dana Vynikarová, Petra Pavlíčková Ondřej Guth Dana Vynikarová (Gar.)</i>	KZ	4		L	PP
BIE-PV-EM.2015	<b>Compulsory Elective Economics, and Management Courses, in English, Version 2015</b> <i>BIE-EPŘ,BIE-FTR.1,..... (pokračování viz seznam skupin níže)</i>	Min. předm. 1	Min/Max 4/10			VE
BIE-PV-HU.2015	<b>Compulsory Elective Bachelor Social Courses, Presented in English, Ver. 2015</b> <i>BIE-HMI,FIE-HTE,..... (pokračování viz seznam skupin níže)</i>	Min. předm. 1 Max. předm. 3	Min/Max 2/9			VH
BIE-V.2017	<b>Purely Elective Bachelor Courses, Version 2017</b> <i>BIE-ZUM,BIE-ZRS,..... (pokračování viz seznam skupin níže)</i>	Min. předm. 0	Min/Max 0/22			V

## Seznam skupin předmětů tohoto průchodu s úplným obsahem členů jednotlivých skupin

Kód	Název skupiny předmětů a kódy členů této skupiny předmětů (specifikace viz zde nebo níže seznam předmětů)	Zakončení	Kredity	Rozsah	Semestr	Role
<b>BIE-PV-EM.2015</b>	<b>Compulsory Elective Economics, and Management Courses, in English, Version 2015</b>	<b>Min. předm. 1</b>	<b>Min/Max 4/10</b>			<b>VE</b>
BIE-EPR	Economic project	BIE-FTR.1	Financial Markets	BIE-MIK	Fundamentals of Microeconomics	
BIE-EHD	Introduction to European Economi ...					
<b>BIE-PV-HU.2015</b>	<b>Compulsory Elective Bachelor Social Courses, Presented in English, Ver. 2015</b>	<b>Min. předm. 1</b> <b>Max. předm. 3</b>	<b>Min/Max 2/9</b>			<b>VH</b>
BIE-HMI	History of Mathematics and Infor ...	FIE-HTE	History of Technology and Econom ...	FI-HPZ	Humanitní předmět z výjezdu v za ...	
BIE-EHD	Introduction to European Economi ...	AE0B16F11	Philosophy I			
<b>BIE-V.2017</b>	<b>Purely Elective Bachelor Courses, Version 2017</b>	<b>Min. předm. 0</b>	<b>Min/Max 0/22</b>			<b>V</b>
BIE-ZUM	Artificial Intelligence Fundamen ...	BIE-ZRS	Basics of System Control	BIE-FTR.1	Financial Markets	
BIE-EHD	Introduction to European Economi ...	BIE-IMA	Introduction to Mathematics	BIE-IMA2	Introduction to Mathematics 2	
BIE-ST1	Network Technology 1	BIE-OOP	Object-Oriented Programming	BIE-PHP.1	Programing in PHP	
BIE-PJV	Programming in Java	BI-SCE1	Seminář počítačového inženýrství ...	BIE-CZ0	Základy češtiny pro cizince	
BIE-3DT.1	3D Printing					

## Seznam předmětů tohoto průchodu:

Kód	Název předmětu	Zakončení	Kredity
AE0B16F11	Philosophy I We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics. Výsledek studentské ankety předmětu je zde: <a href="http://www.fel.cvut.cz/anketa/aktualni/courses/AE0B16F11">http://www.fel.cvut.cz/anketa/aktualni/courses/AE0B16F11</a>	KZ	4
BI-SCE1	Seminář počítačového inženýrství I Seminář počítačového inženýrství je výběrový předmět pro studenty, kteří se chtějí zabývat hlouběji tématy číslicového návrhu, spolehlivosti a odolnosti proti poruchám a útokům. Ke studentům se v rámci předmětu přistupuje individuálně a každý student či skupinka studentů řeší nějaké zajímavé aktuální téma s vybraným školitelem. Součástí předmětu je práce s vědeckými články a jinou odbornou literaturou a/nebo práce v laboratořích KČN. Kapacita předmětu je omezena možnostmi učitelů semináře. Probíraná témata jsou pro každý semestr nová.	Z	4
BIE-3DT.1	3D Printing Students learn to design three-dimensional objects optimized for printing on a RepRap printer and the printing itself. They will be able to design objects, prepare for printing and print in 3D.	KZ	4
BIE-AAG	Automata and Grammars Students are introduced to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite automata, regular expressions and regular grammars, translation finite automata, construction and use of pushdown automata, hierarchy of formal languages, relationships between formal languages and automata. Knowledge acquired through the module is applicable in designs of algorithms for searching in text, data compression, simple parsing and translation, and design of digital circuits.	Z,ZK	6
BIE-AG1	Algorithms and Graphs 1 The course covers the basics from the efficient algorithm design, data structures, and graph theory, belonging to the core knowledge of every computing curriculum. It is interlinked with the concurrent BIE-AAG and BIE-ZDM courses in which the students gain the basic skills and knowledge needed for time and space complexity of algorithms and learn to handle practically the asymptotic mathematics.	Z,ZK	6
BIE-AG2	Algorithms and Graphs 2	Z,ZK	5
BIE-APS.1	Architectures of Computer Systems Students understand architectures of uniprocessor computers at the level of machine instructions, with emphasis to instruction pipelining and memory hierarchy. They know the main concepts of RISC and CISC architectures. They learn how modern computers work and how they are constructed. They learn about the techniques that today's processors use to increase the program execution speed. They have a basic knowledge allowing them to optimise their programs to fully exploit a given processor architecture. They get an idea about the trends in the area of computer architectures and how they will affect software. They also understand the architectures of vector processors, their use in today's microprocessors. They understand the principles of shared-memory multiprocessor system architectures and the issues of memory consistency.	Z,ZK	5
BIE-BAP	Bachelor Thesis	Z	14
BIE-BEZ	Security Students understand the mathematical fundamentals of cryptography and have an overview of current cryptographic algorithms and applications: symmetric and asymmetric cryptosystems, and hash functions. They also learn the fundamentals of secure programming and IT security, the fundamentals of designing and using modern cryptosystems for computer systems. They are able to properly and securely use cryptographic primitives and systems that are based on these primitives. Students are introduced to legal aspects of information security, security standards, social engineering, and basic principles of security management.	Z,ZK	6
BIE-BPR	Bachelor Project	Z	2

BIE-CAO	Digital and Analog Circuits	Z,ZK	5
Students get the fundamental understanding of technologies underlying electronic digital systems. They understand the basic theoretical models and principles of functionality of transistors, gates, circuits, and conductors. They are able to design simple circuits and evaluate circuit parameters. They understand the differences between analog and digital modes of electronic devices.			
BIE-CZ0	Základy češtiny pro cizince	KZ	2
Kurz Základy češtiny pro cizince obsahuje základní témata konverzace: Seznamování, Orientace, Nakupování, Práce/Studium, Cestování, Čas, Rodina, na kterých se student seznámí s češtinou a jejím používání.			
BIE-DBS	Database Systems	Z,ZK	6
Students are introduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn to design small databases (including integrity constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the SQL language, as well as with its theoretical foundation - the relational database model. They learn the principles of normalizing a relational database schema. They understand the fundamental concepts of transaction processing, controlling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced to special ways of storing data in relational databases with respect to speed of access to large quantities of data. This introductory-level module does not cover: Administration of database systems, debugging and optimizing database applications, distributed database systems, data stores.			
BIE-DPR	Documentation, Presentation, Rhetorics	KZ	4
BIE-EHD	Introduction to European Economic History	Z,ZK	3
The course introduces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economy through the description of the key periods in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic history. From large economic area of Roman Empire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutions is deciphered. The course does not cover detailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and organizations in history. Class meetings will consist of a mixture of lecture and discussion.			
BIE-EMP	Economic and management principles	KZ	4
This course is aimed to fundamental problems of business economy. The course makes students familiar with a life cycle of business, specifically with fields: enterprise foundation, enterprise putting into state economic environment (CR), management of property and capital structure, business transaction records keeping during an accounting period, a relation between business production and costs, evaluation of enterprise financial health and business rehabilitation or termination.			
BIE-EPR	Economic project	Z	1
This course is an extension of the course Introduction to European Economic History (BIE-EHD).			
BIE-FTR.1	Financial Markets	Z,ZK	5
Financial sector has been deeply transformed in the recent years, which led to a development of structured financial products, a new point of view on the issue of credit risk, and globalization of market activities. The need to use and properly apply mathematical and technical tools is emphasized. To manage their financial activities, many firms need graduates from technical schools who have sufficient knowledge ICT and mathematics, and who have at the same time an understanding of the functioning of financial markets. The Financial Markets course thus englobes both a description of financial markets and related economic theories, and an overview of mathematical and statistical tools used in this field.			
BIE-HMI	History of Mathematics and Informatics	Z,ZK	3
Students will master the methods traditionally used in mathematics and related disciplines - informatics - from different periods of the development of mathematics, and will thus become acquainted with mathematical methods suitable for applications in contemporary computer science.			
BIE-IMA	Introduction to Mathematics	Z	4
Students refresh and extend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are able to apply them in particular examples.			
BIE-IMA2	Introduction to Mathematics 2	Z	2
Students refresh and extend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are able to apply them in particular examples.			
BIE-LIN	Linear Algebra	Z,ZK	7
Students understand the theoretical foundation of algebra and mathematical principles of linear models of systems around us, where the dependencies among components are only linear. They know the basic methods for operating with polynomials and linear spaces. They are able to perform matrix operations and solve systems of linear equations. They can apply these mathematical principles to solving problems in 2D or 3D analytic geometry. They understand error-detecting and error-correcting codes.			
BIE-MIK	Fundamentals of Microeconomics	Z,ZK	4
This a introductory course of microeconomics designed for students without previous economic background. It describes different market regimes and ways how firm can react to consumer demand, competitor strategies, government intervention, uncertainty and information asymmetry. All concepts are illustrated on real life examples.			
BIE-MLO	Mathematical Logic	Z,ZK	5
An introduction to predicate logic, the standard language and deductive system of mathematics and computer science.			
BIE-OOP	Object-Oriented Programming	Z,ZK	4
Students will learn the pure object-oriented paradigm, being a tool for effective implementation of quality, evolvable business software systems. They will understand fundamentals and they will learn how to apply it for solving typical implementation tasks. Students will learn syntax and programming fundamentals of a pure OO open-source technology Pharo. Various other modern programming languages utilising the OO concepts will be introduced in the subject, as well.			
BIE-OSY	Operating Systems	Z,ZK	5
Students understand the classical theory of operating systems (OS) in addition to the knowledge gained in the BI-PS1 module. They get a solid knowledge of OS kernels, processes and threads implementations. They understand the problems of race conditions and principles and algorithms for critical sections, thread scheduling, resource allocation, deadlocks. They understand the techniques of managing virtual memory, principles and architectures of disks and disk arrays, file systems and peripheral devices. They gain basic knowledge necessary for developing system applications or for system administration. They are able to design and implement simple multithreaded applications.			
BIE-PA1	Programming and Algorithmics 1	Z,ZK	6
Students learn to construct algorithms for solving basic problems and write them in the C language. They understand data types (simple, structured, pointers), expressions, statements, functions, concept of recursion. They learn the basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating with linked lists.			
BIE-PA2	Programming and Algorithmics 2	Z,ZK	7
Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, set, table). They can implement linked structures. They learn these skills using the programming language C++. Although this is not a module of programming in C++, students are introduced to all C++ features needed to achieve the main objective (e.g., operator overloading, templates).			
BIE-PAI	Law and Informatics	ZK	3
Students have knowledge of fundamental protection of intangible property, overview of contractual aspects of copyright. They are able to design an appropriate contract-based copyright protection and do research and verification of the outputs concerning trademarks, patents, industrial design rights. They are able to participate actively in the proceedings to register intangible property. They have a good overview of the Czech Republic legislation as well as the EU legislation.			

BIE-PHP.1	Programing in PHP	KZ	4
Main goal of the course is an introduction to PHP - language and technology. Students will learn also best practices and will use tool that eases development in PHP. The course is recommended for students of BIE-WSI-WI.2015 branch of study and do not have required knowledge to register for BIE-TWA.1. They should register for this course in their 3rd semester of study.			
BIE-PJP	Programming Languages and Compilers	Z,ZK	5
Students master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler parts for a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target form and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other programs for parsing and processing text in a language defined by a LL(1) grammar.			
BIE-PJV	Programming in Java	Z,ZK	4
BIE-PPA	Programming Paradigms	Z,ZK	5
BIE-PS1	Programming in Shell 1	KZ	5
Students understand the basic principles of operating systems (processes and threads, file systems, access rights, memory management, network interface) with a focus on UNIX like operating systems. In practically oriented exercises, they will learn to use shell, basic commands and filters for processing text data.			
BIE-PSI	Computer Networks	Z,ZK	5
Students understand the basic common techniques, protocols, technologies, and algorithms necessary to communicate in computer networks focusing primarily the 2nd to 4th layer of the ISO OSI model. They also get a basic understanding of communication media, security, and network administration. Students will be able to write a simple network application and configure a simple network.			
BIE-PST	Probability and Statistics	Z,ZK	5
Students are introduced to elements of probability thinking, ability of the synthesis both prior and posterior information and use to work with random variables. They will be able to apply correctly basic models of the distribution of random variables and to solve applied probability problems in the area of informatics and computer science. Using statistical inference methods, they master methods of statistical inference to estimate unknown population parameters on the basis of sample. They get acquainted with basic methods of the determination of possible statistical dependence of two or more random variables.			
BIE-SAP	Computer Structures and Architectures	Z,ZK	6
Students understand basic digital computer units and their structures, functions, and hardware implementation: ALU, control unit, memory system, inputs, outputs, data storage and transfer. In the labs, students gain practical experience with the design and implementation of the logic of a simple processor using modern digital design tools.			
BIE-SI1.2	Software Engineering I	Z,ZK	5
Students learn the methods of analysis and design of large software systems, which are typically designed and implemented in teams. Students will get acquainted with CASE tools using a visual modeling language UML for modeling and solving software-related problems. Students will get an overview of object-oriented analysis, design, architecture, validation, verification, and testing processes. The knowledge obtained in the lectures is practiced on a team project. If enrolled for the BIE-SP1 course running in parallel (only summer semester), the students can work on a single more complex project and they are classified to both courses for a single project. This course does not teach the students programming, nor any particular technology, framework or programming language. The students are required to have some knowledge of these to apply them on their team project.			
BIE-ST1	Network Technology 1	Z	3
Předmět je zaměřen na získání základních znalostí z oblasti počítačových sítí a praktických zkušeností se sítovými technologiemi. Předmět odpovídá látce kurikula Cisco Netacad programu - CCNA1 - R&S Introduction to Networks.			
BIE-VZD	Data Mining	Z,ZK	4
Students are introduced to the basic methods of discovering knowledge in data. In particular, they learn the basic techniques of data preprocessing, multidimensional data visualization, statistical techniques of data transformation, and fundamental principles of knowledge discovery methods. Students will be aware of the relationships between model bias and variance and will know the fundamentals of assessing model quality. Data mining software is extensively used in the module. Students will be able to apply basic data mining tools to common problems (classification, regression, clustering).			
BIE-ZDM	Elements of Discrete Mathematics	Z,ZK	5
Students get both a mathematical sound background, but also practical calculation skills in the area of combinatorics, value estimation and formula approximation, and tools for solving recurrent equations.			
BIE-ZMA	Elements of Calculus	Z,ZK	6
Students acquire knowledge and understanding of the fundamentals of classical calculus so that they are able to apply mathematical way of thinking and reasoning and are able to use basic proof techniques. They get skills to practically handle functions of one variable in solving the problems in informatics. They understand the links between the integrals and sums of sequences. They are able to estimate lower or upper bounds of values of real functions and to handle simple asymptotic expressions.			
BIE-ZRS	Basics of System Control	Z,ZK	4
Volitelný předmět základy řízení systémů je určen pro všechny zájemce o aplikovanou informatiku v bakalářském studiu. Alespoň přehledové znalosti oboru automatického řízení budou pro naše absolventy jistě konkurenční výhodou a zhodnotí je bezesporu v průmyslové praxi. Studenti získají znalosti v dynamicky se rozvíjícím oboru s velkou budoucností. Zaměříme se zejména na řízení inženýrských a fyzikálních systémů. Poskytneme vám základní informace z oblasti zpětnovazebního řízení lineárních dynamických jednorozměrových systémů. Seznámíme vás s metodami vytváření popisu a modelu systémů, základní analýzou lineárních dynamických systémů a návrhem a ověřením jednoduchých zpětnovazebních PID, PSD a fuzzy regulátorů. Pozornost je věnována rovněž snímačům a akčním členům v regulačních obvodech, otázkám stability regulačních obvodů, jednorázovému a průběžnému nastavování parametrů regulátoru a některým aspektům průmyslových realizací spojitých a číselných regulátorů. Jednotlivá témata přednášek jsou provázána množstvím užitečných příkladů a praktických průmyslových realizací.			
BIE-ZUM	Artificial Intelligence Fundamentals	Z,ZK	4
Students are introduced to the fundamental problems in the Artificial Intelligence, and the basic methods for their solving. It focuses mainly on the classical tasks from the areas of state space search, multi-agent systems, game theory, planning, and machine learning. Modern soft-computing methods, including the evolutionary algorithms and the neural networks, will be presented as well.			
FI-HPZ	Humanitní předmět z výjezdu v zahraničí	Z	3
Předmět "Humanitní předmět z výjezdu v zahraničí" zastřešuje ve studijním plánu povahou humanitní předměty získané studenty v rámci jejich výjezdu v zahraničí. Předpokládá se tedy splnění náhradou a o uznání rozhoduje proděkan pro studijní a pedagogickou činnost v zastoupení děkana a to na základě žádosti studenta			
FIE-HTE	History of Technology and Economics	ZK	2
The course introduces the scientific disciplines of history and technology , economic and social history of the Czech lands and Czechoslovakia in comparison with the development of the European region 19 to 21 century.			

Aktualizace výše uvedených informací naleznete na adrese <http://bilakniha.cvut.cz/cs/FF.html>

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