

Doporu ený pr chod studijním plánem

Název pr chodu: Bachelor branch Computer Science, in English, 2015-2020

Fakulta: Fakulta informa ních technologií

Katedra:

Pr chod studijním plánem: Bachelor branch Computer Science, in English, 2015-2020

Obor studia, garantovaný katedrou: Úvodní stránka

Garant oboru studia:

Program studia: Informatics, valid until 2024

Typ studia: Bakalá ské prezen ní

Poznámka k pr chodu: Compulsory subjects of neighboring specializations can be enrolled as optional ones.

Kódování rolí p edm t a skupiny p edm t :

P - povinné p edm ty programu, PO - povinné p edm ty oboru, Z - povinné p edm ty, S - povinn volitelné p edm ty, PV - povinn volitelné p edm ty, F - volitelné p edm ty odborné, V - volitelné p edm ty, T - t lovýchovné p edm ty

Kódování zp sob zakon ení predm t (KZ/Z/ZK) a zkratk semestr (Z/L):

KZ - klasifikovaný zápo et, Z - zápo et, ZK - zkouška, L - letní semestr, Z - zimní semestr

íslo semestru: 1

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garantí (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-CAO	Digital and Analog Circuits	Z,ZK	5	2P+2C	Z	PP
BIE-ZMA	Elements of Calculus Tomáš Kalvoda	Z,ZK	6	3P+2C	Z	PP
BIE-MLO	Mathematical Logic	Z,ZK	5	2P+2C	Z	PP
BIE-PA1	Programming and Algorithmics 1	Z,ZK	6	2P+2R+2C	Z	PP
BIE-PS1	Programming in Shell 1	KZ	5	2P+2C	Z	PP
BIE-PAI	Law and Informatics	ZK	3	2P	Z	PO

íslo semestru: 2

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garantí (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-SAP	Computer Structures and Architectures	Z,ZK	6	2P+1R+2C	L	PP
BIE-DBS	Database Systems	Z,ZK	6	3L	Z,L	PP
BIE-LIN	Linear Algebra Antonella Marchesiello Antonella Marchesiello Antonella Marchesiello (Gar.)	Z,ZK	7	4P+2C	L	PP
BIE-PA2	Programming and Algorithmics 2 Jan Trávní ek	Z,ZK	7	2P+1R+1C	L	PP
BIE-V.2017	Purely Elective Bachelor Courses, Version 2017 BIE-ZUM,BIE-ZRS,..... (pokra ování viz seznam skupin níže)	Min. p edm. 0	Min/Max 0/22			V

íslo semestru: 3

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garantí (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-AG1	Algorithms and Graphs 1 Dušan Knop	Z,ZK	6	2P+2C	Z	PP
BIE-AAG	Automata and Grammars	Z,ZK	6	2P+2C	Z	PP
BIE-ZDM	Elements of Discrete Mathematics Jí ina Scholtzová	Z,ZK	5	2P+2C	Z	PP
BIE-SI1.2	Software Engineering I Zden k Rybola Zden k Rybola Zden k Rybola (Gar.)	Z,ZK	5	2P+1C	Z,L	PP
BIE-EMP	Economic and management principles Tomáš Evan	KZ	4	2P+2C	Z,L	PE
BIE-V.2017	Purely Elective Bachelor Courses, Version 2017 BIE-ZUM,BIE-ZRS,..... (pokra ování viz seznam skupin níže)	Min. p edm. 0	Min/Max 0/22			V

íslo semestru: 4

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-PSI	Computer Networks	Z,ZK	5	2P+1R+1C	L	PP
BIE-OSY	Operating Systems	Z,ZK	5	2P+1R+1L	L	PP
BIE-BEZ	Security	Z,ZK	6	2P+1R+1C	L	PP
BIE-AG2	Algorithms and Graphs 2 <i> Ond ej Suchý</i>	Z,ZK	5	2P+2C	L	PO
BIE-PJP	Programming Languages and Compilers	Z,ZK	5	2P+1C	L	PO
BIE-V.2017	Purely Elective Bachelor Courses, Version 2017 <i>BIE-ZUM,BIE-ZRS,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 0	Min/Max 0/22			V

íslo semestru: 5

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-BPR	Bachelor Project <i>Zden k Muziká Zden k Muziká (Gar.)</i>	Z	2		Z,L	PP
BIE-PST	Probability and Statistics	Z,ZK	5	2P+1R+1C	Z	PP
BIE-APS.1	Architectures of Computer Systems	Z,ZK	5	2P+2C	Z	PO
BIE-VZD	Data Mining <i>Daniel Vašata, Rodrigo Augusto Da Silva Alves Daniel Vašata Daniel Vašata (Gar.)</i>	Z,ZK	4	2P+2C	Z	PO
BIE-OOP	Object-Oriented Programming	Z,ZK	4	2P+2C	Z	PO
BIE-PPA	Programming Paradigms	Z,ZK	5	2P+2C	Z	PO
BIE-V.2017	Purely Elective Bachelor Courses, Version 2017 <i>BIE-ZUM,BIE-ZRS,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 0	Min/Max 0/22			V

íslo semestru: 6

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-BAP	Bachelor Thesis <i>Zden k Muziká Zden k Muziká (Gar.)</i>	Z	14		L,Z	PP
BIE-DPR	Documentation, Presentation, Rhetorics <i>Dana Vynikarová</i>	KZ	4		L	PP
BIE-PV-EM.2015	Compulsory Elective Economics, and Management Courses, in English, Version 2015 <i>BIE-EPR,BIE-FTR.1,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 1	Min/Max 4/10			VE
BIE-PV-HU.2015	Compulsory Elective Bachelor Social Courses, Presented in English, Ver. 2015 <i>BIE-HMI,FI-HPZ,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 1 Max. p edm. 3	Min/Max 2/9			VH
BIE-V.2017	Purely Elective Bachelor Courses, Version 2017 <i>BIE-ZUM,BIE-ZRS,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 0	Min/Max 0/22			V

Seznam skupin p edm t tohoto pr chodu s úplným obsahem len jednotlivých skupin

Kód	Název skupiny p edm t a kódy len této skupiny p edm t (specifikace viz zde nebo níže seznam p edm t)	Zakon ení	Kredity	Rozsah	Semestr	Role
BIE-PV-EM.2015	Compulsory Elective Economics, and Management Courses, in English, Version 2015	Min. p edm. 1	Min/Max 4/10			VE
BIE-EPR	Economic project	BIE-FTR.1	Financial Markets	BIE-MIK	Fundamentals of Microeconomics	
BIE-EHD	Introduction to European Economi ...					
BIE-PV-HU.2015	Compulsory Elective Bachelor Social Courses, Presented in English, Ver. 2015	Min. p edm. 1 Max. p edm.	Min/Max 2/9			VH

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
This subject is aimed to the professional communication and writing of the scientific texts (bachelor's and diploma thesis). Students will learn to create and prepare interactive presentations and presenting before an audience. Students will also learn to write technical reports and scientific texts.			
BIE-EHD	Introduction to European Economic History	Z,ZK	3
The course introduces a selection of themes from European economic history. It gives the student basic knowledge about forming of the global economy through the description of the key historical periods. As European countries have been dominant actors in this process it focuses predominantly on their roles in economic history. From the large economic area of the Roman Empire to the fragmentation of the Middle Ages, from the destruction of WWII to the current affairs, the development of modern financial institutions is deciphered. The course does not cover the detailed economic history of particular European countries but rather the impact of trade and the role of particular events, institutions and organizations in history. Class meetings will consist of a mixture of lectures and discussions.			
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 is an 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 propositional and predicate logic.			
BIE-OOP	Object-Oriented Programming	Z,ZK	4
Object-oriented programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course we look at some of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development including testing, error handling, refactoring and design patterns.			
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-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
Tento kurz je prezentován v angli tin . Existuje ale také eská varianta BI-PJV a BIK-PJV.			
BIE-PKM	Preparatory Mathematics	Z	4
The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathematics.			
BIE-PPA	Programming Paradigms	Z,ZK	5

BIE-PRR.21	Project management	Z,ZK	5
The aim of the course is to introduce students into the basic concepts and principles of project management, i.e. methods of planning, teamwork, analysis, crisis management in a project, communication, argumentation and meeting management. Students will practice project management techniques (e.g. SWOT analysis, risk assessment and management, Gantt charts, resource schedule, resource balancing, network graphs) and creation of project documentation. The course is designed especially for students who are interested in deepening their knowledge outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in large companies. The course is also suitable for all those who will develop software or hardware in the form of team projects.			
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-PS2	Programming in shell 2	Z,ZK	4
Students get a general overview of scripting languages, introduction into syntax, semantics, programming style, data structures, pros and cons. In addition, they gain a deeper insight into Bourne Again shell and some other particular scripting languages and will get practical experience with shell script programming. Note to Erasmus students: We are ready do adapt the lectures to provide even very basic Bourne shell usage. Depending on actual knowledge of the students, orientation in user filesystem tools (cp, ln, mkdir, rm...) and useful basic data filtering tools (cut, tr, sort, uniq...) can be provided. The advantage of this module is that we do not stop at this point - we will show you also a selection of advanced scripting techniques used in practice.			
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
The students will learn the basics of probabilistic thinking, the ability to synthesize prior and posterior information and learn to work with random variables. They will be able to apply basic models of random variable distributions and solve applied probabilistic problems in informatics and computer science. Using the statistical induction they will be able to perform estimations of unknown distributional parameters from random sample characteristics. They will also be introduced to the methods of determining the 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-SCE1	Computer Engineering Seminar I	Z	4
The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to failures and attacks. Students are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is work with scientific articles and other professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each semester.			
BIE-SCE2	Computer Engineering Seminar II	Z	4
The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to failures and attacks. Students are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is work with scientific articles and other professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each semester.			
BIE-SEP	World Economy and Business	Z,ZK	4
The course introduces students of technical universities to international business. It does that predominantly by comparing individual countries and key regions of the world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for the right investment decision. Seminars help to improve knowledge in the form of discussions based on individual readings.			
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
P edm t je zam en na získání základních znalostí z oblasti počítačových sítí a praktických zkušeností se síťovými technologiemi. P edm t odpovídá látce kurikula Cisco Netacad programu - CCNA1 - R&S Introduction to Networks.			
BIE-VAK.21	Selected Combinatorics Applications	Z	3
The course aims to introduce students in an accessible form to various branches of theoretical computer science and combinatorics. In contrast to the basic courses, we approach the issue from applications to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basic data structures. Furthermore, with the active participation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) informatics. Areas from which we will select problems to be solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimization and more. Students will also try to implement solutions to the studied problems with a special focus on the effective use of existing tools.			
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 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. This course is last taught in the winter semester 2021/22 (B211). Latecomers who fail to meet it can replace it with a pair of courses BIE-MA1.21 and BIE-MA2.21.			
BIE-ZRS	Basics of System Control	Z,ZK	4
Volitelný p edm t základy řízení systém je určen pro všechny zájemce o aplikovanou informatiku v bakalářském studiu. Alespo p ehledové znalosti oboru automatického řízení budou pro naše absolventy jist konkuren ní výhodou a zhodnotí je bezesporu v pr myslové praxi. Studenti získají znalosti v dynamicky se rozvíjejícím oboru s velkou budoucností.			

Zaměřme se zejména na řízení inženýrských a fyzikálních systémů. Poskytneme vám základní informace z oblasti zprávného řízení lineárních dynamických jednorozměrných systémů. Seznámíme vás s metodami vytváření popisu a modelu systému, základní analýzou lineárních dynamických systémů a návrhem a ověřením jednoduchých zprávných PID, PSD a fuzzy regulátorů. Pozornost je věnována rovněž snímání a akčním členům v regulačních obvodech, otázkám stability regulačních obvodů, jednorázovému a průběžnému nastavování parametrů regulátorů a některým aspektům praxe realizací spojitých a diskrétních regulátorů. Jednotlivá témata pojednání jsou provázána množstvím užitečných příkladů a praktických praxe 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 předmet z výjezdu v zahraničí	Z	3
Předmet "Humanitní předmet z výjezdu v zahraničí" zastřešuje ve studijním plánu povahou humanitní předmety získané studenty v rámci jejich výjezdu v zahraničí. Předpokládá se tedy splnění náhradou a o uznání rozhoduje prodekan pro studijní a pedagogickouinnost v zastoupení děkana a to na základě žádosti studenta			

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

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