Doporu ený pr chod studijním plánem

Název pr chodu: Bachelor branch Security and Information Technology, in English, 2015-2020

Fakulta: Fakulta informa ních technologií

Katedra:

Pr chod studijním plánem: Bachelor branch Security and Information Technology, 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 skupin 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 zkratek 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 garanti (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** *Antonella Marchesiello **Tomáš Kalvoda** Tomáš Kalvoda (Gar.)*	Z,ZK	6	3P+2C	Z	PP
BIE-MLO	**Mathematical Logic** *Kate ina Trlifajová **Kate ina Trlifajová** Kate ina Trlifajová (Gar.)*	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 garanti (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 garanti (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** *Ji ina Scholtzová, Jan Legerský **Ji ina Scholtzová** Josef Kolá (Gar.)*	Z,ZK	5	2P+2C	Z	PP
BIE-APS.1	**Architectures of Computer Systems**	Z,ZK	5	2P+2C	Z	PO
BIE-ADW.1	**Windows Administration** *Miroslav Prágl, Ji í Kašpar **Miroslav Prágl** Miroslav Prágl (Gar.)*	Z,ZK	4	2P+1C	Z	PO
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

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** *Ji í Bu ek*	Z,ZK	6	2P+1R+1C	L	PP
BIE-BEK	**Secure Code** *Róbert Lórencz*	Z,ZK	5	2P+2C	L	PO
BIE-ADU.1	**Unix Administration**	Z,ZK	5	2P+2C	L	PO
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

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** *Zden k Muziká Zden k Muziká (Gar.)*	Z	2		Z,L	PP
BIE-PST	**Probability and Statistics**	Z,ZK	5	2P+1R+1C	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-HWB	**Hardware Security** *Filip Kodýtek, Róbert Lórencz, Ji í Bu ek Ji í Bu ek Róbert Lórencz (Gar.)*	Z,ZK	5	2P+2C	Z	PO
BIE-SSB	**System and Network Security** *Ji í Dostál Ji í Dostál Ji í Dostál (Gar.)*	Z,ZK	5	2P+2C	Z	PO
BIE-EMP	**Economic and management principles** *Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)*	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

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** *Zden k Muziká Zden k Muziká (Gar.)*	Z	14		L,Z	PP
BIE-DPR	**Documentation, Presentation, Rhetorics** *Dana Vynikarová Dana Vynikarová Dana Vynikarová (Gar.)*	KZ	4		L	PP
BIE-PV-EM.2015	**Compulsory Elective Economics, and Management Courses, in English, Version 2015** *BIE-EPR,BIE-FTR.1,..... (pokra ování viz seznam skupin níže)*	Min. p edm. 1	Min/Max 4/10			VE
BIE-PV-HU.2015	**Compulsory Elective Bachelor Social Courses, Presented in English, Ver. 2015** *BIE-HMI,FI-HPZ,..... (pokra ování viz seznam skupin níže)*	Min. p edm. 1 Max. p edm. 3	Min/Max 2/9			VH
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

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	Min/Max			VH
				Max. p edm. 3	2/9			
BIE-HMI	History of Mathematics and Infor ...	FI-HPZ	Humanitní p edm t z výjezdu v za ...	BIE-EHD		Introduction to European Economi ...		
BE0B16FI1	Philosophy 1							

BIE-V.2017	**Purely Elective Bachelor Courses, Version 2017**			Min. p edm. 0	Min/Max			V
					0/22			
BIE-ZUM	Artificial Intelligence Fundamen ...	BIE-ZRS	Basics of System Control	BIE-CCN		Compiler Construction		
BIE-SCE1	Computer Engineering Seminar I	BIE-SCE2	Computer Engineering Seminar II	BIE-CZ0		Czech Language for Foreigners		
BIE-CZ1.21	Czech Language for Foreigners II	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-PKM	Preparatory Mathematics	BIE-PJV		Programming in Java		
BIE-PS2	Programming in shell 2	BIE-PRR.21	Project management	BIE-VAK.21		Selected Combinatorics Applicati ...		
BI-SCE1	Seminá po íta ového inženýrství ...	TV2K1	T lesná výchova 2	BIE-SEP		World Economy and Business		
BIE-3DT.1	3D Printing							

Seznam p edm t tohoto pr chodu:

Kód	Název p edm tu	Zakon ení	Kredity
BE0B16FI1	Philosophy 1	KZ	4
	Probírají se postavy a myšlenky antické filozofie a v dy. Na historickém pozadí se otevírají i aktuální problémy dneška. Jde zejména o otázky související s rozvojem dnešní fyziky, matematiky a p írodov dy, dále s rozvojem a spole enskými aspekty techniky a otázek ekonomiky, etiky a politiky.		
BI-SCE1	Seminá po íta ového inženýrství I	Z	4
	Seminá po íta ového inženýrství je výb rový p edm t pro studenty, kte í se cht jí zabývat hloub ji tématy íslicového návrhu, spolehlivosti a odolnosti proti poruchám a útok m. Ke student m se v rámci p edm tu p istupuje individuáln a každý student i skupinka student eší n jaké zajímavé aktuální téma s vybraným školitelem. Sou ástí p edm tu je práce s v deckými lánky a jinou odbornou literaturou a/nebo práce v laborato ích K N. Kapacita p edm tu je omezena možnostmi u itel seminá e. Probíraná témata jsou pro každý semestr nová.		
BIE-3DT.1	3D Printing	KZ	4
	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.		
BIE-AAG	Automata and Grammars	Z,ZK	6
	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.		
BIE-ADU.1	Unix Administration	Z,ZK	5
	Students became familiar with the internal structure of Unix-like systems, with the administration of their basic subsystems and with the principles of their protection against unauthorized use. In the seminars they will verify the information from the lectures on real life examples from practice. They will understand the differences between user and administrator roles. They gain theoretical and practical knowledge of tools for tracking, analyzing, debugging and securing systems, implementing and managing file systems, disk subsystems, processes, memory, network services, shared file systems, name services, remote access, and system boot.		
BIE-ADW.1	Windows Administration	Z,ZK	4
	Students understand the architecture and internals of the Windows OS and acquire the skills to administrate the Windows OS. They are able use the standard administration and security tools and apply advanced ActiveDirectory administration methods. They are able to solve problems by applying appropriate troubleshooting methods and administrate heterogeneous systems. Students are able to effectively configure centralised administration of a computer network.		
BIE-AG1	Algorithms and Graphs 1	Z,ZK	6
	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.		
BIE-APS.1	Architectures of Computer Systems	Z,ZK	5
	Students will learn the construction principles of internal architecture of computers with universal processors at the level of machine instructions. Special emphasis is given on the pipelined instruction processing and on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the principles of instruction processing not only in scalar processors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness of the sequential model of programs. The course further elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory coherence and consistency in such systems.		
BIE-BAP	Bachelor Thesis	Z	14
BIE-BEK	Secure Code	Z,ZK	5
	Studenti se nau í posuzovat a zohled ovat bezpe nostní rizika p i návrhu svého kódu a ešení v b žné inženýrské praxi. Od teorie modelování bezpe nostních rizik p istoupí k praxi, ve které si vyzkouší b h program pod nižšími oprávn ními a jak tato oprávn ní stanovovat, protože ne každý program musí nutn b žet s administrátorským oprávn ním. Budou také prakticky demonstrována rizika spojená s p ete ením bufferu. Dále se studenti budou krátce v novat zabezpe ení dat a jak toto zabezpe ení souvisí s databázovými systémy a webem. V záv ru se budou v novat útok m typu DoS (Denial of Service) a obran proti nim.		
BIE-BEZ	Security	Z,ZK	6
	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.		

BIE-BPR	Bachelor Project	Z	2
At the beginning of the semester the student will contact the supervisor of the bachelor thesis he has booked. They will discuss the partial tasks that student will perform during the semester. If he fulfill these tasks, the supervisor will award him / her at the end of the semester with the BI-BPR course.			
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-CCN	Compiler Construction	Z,ZK	5
This is an introductory class on compiler construction for bachelor students in computer science. The goal of the class is to introduce basic principles of compilers for students to understand the design and implementation of programming languages. Seeing and actually understanding self-compilation is the overarching theme of the class.			
BIE-CZ0	Czech Language for Foreigners	KZ	2
Course Czech for foreigners offers the basic topics of conversation: Introductions, Orientation, Shopping, Work / Study, Travel, Time, Family.			
BIE-CZ1.21	Czech Language for Foreigners II	KZ	2
The course is intended for Students of English programmes who have completed BIE-CZ0 course or have basic knowledge of the Czech language. The course further expands the basic vocabulary and clarifies the structure of the Czech language structure with regard to the practical needs of Students residing in the Czech Republic.			
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
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-HWB	Hardware Security	Z,ZK	5
The course deals with hardware resources used to ensure security of computer systems including embedded ones. The students become familiar with the operating principles of cryptographic modules, the security features of modern processors, and storage media protection through encryption. They will gain knowledge about vulnerabilities of HW resources, including side-channel attacks and tampering with hardware during manufacture. Students will have an overview of contact and contactless smart card technology including applications and related topics for multi-factor authentication (biometrics). Students will understand the problems of effective implementation of ciphers.			
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 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 handing, 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-PJV	Programming in Java	Z,ZK	4
Tento kurz je prezentován v anglitin. 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-PRR.21	Project ma19nagement	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 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 KN 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 KN 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 minimum of enrolled students is 8. If the capacity is not fulfilled, the course will not be taught. 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-SSB	System and Network Security	Z,ZK	5
The students will understand the public key infrastructure (PKI), its strengths and weaknesses, its vulnerabilities againstattacks. The students will also understand the analysis of network protocols from the perspectives of: authentication and authorisation,key exchange, and encryption. They get an overview of the security mechanisms of operating systems (OSs), of the ways virtualization canbe used to protect OSs, and of the security mechanisms for the OS memory. The students will learn basic methods of forensic analysisof storage			

media and networks. The students will also understand security of the networking infrastructure and its protocols andwill be able to design and implement a secured and survivable network. Students will also get an overview of securing data in clouds,database systems, and servers.

BIE-ST1	Network Technology 1	Z	3

Předmět je zaměřen na získání základních znalosti z oblasti počítačových sítí a praktických zkušeností se síťovými technologiemi. Předmět odpovída 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-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 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 rozvíjejícím oboru s velkou budoucností. Zaměříme se zejména na řízení inženýrských a fyzikálních sysémů. 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 číslicových regulátorů. Jednotlivá témata přednášek jsou provázena množstvím užitených 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 zahraniční. Předpokládá se tedy splnění náhradou a o uznání rozhoduje proděkan pro studijní a pedagogickou činnost v zastoupení děkana a to na základě žádosti studenta

TV2K1	Tělesná výchova 2	Z	1

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