## Doporučený průchod studijním plánem

### Název průchodu: Bachelor specialization Computer Systems and Virtualization, 2021

Fakulta: Fakulta informačních technologií

Katedra:

Průchod studijním plánem: Bachelor Specialization Computer Systems and Virtualization, 2021

Obor studia, garantovaný katedrou: Úvodní stránka

Garant oboru studia:

Program studia: Informatics Typ studia: Bakalářské prezenční

Poznámka k průchodu: In addition to purely elective courses, compulsory courses in neighboring specializations can also be enrolled here as electives. The BIE-ECC course can be recognized for any active semester after the submission of a certificate certificate that demonstrates their proficiency in English comparable to or exceeding the B2 level of the Common European Framework of Reference for Languages.

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 predmětů (KZ/Z/ZK) a zkratek semestrů (Z/L):

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

#### Číslo semestru: 1

Kód	Vyučující, <b>autoři</b> a garanti (gar.)		Kredity	Rozsah	Semestr	Role
BIE-DML.21	Discrete Mathematics and Logic Eva Pernecká, Jitka Rybníčková, Francesco Dolce Eva Pernecká Eva Pernecká (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
BIE-LA1.21	Linear Algebra 1 Marzieh Forough Karel Klouda Marzieh Forough (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
BIE-PA1.21	Programming and Algorithmics 1 Jan Trávníček, Ladislav Vagner, Radek Hušek, Josef Vogel <b>Jan Trávníček</b> Jan Trávníček (Gar.)	Z,ZK	7	2P+2R+2C	Z	PP
BIE-GIT.21	SW Development Technologies Petr Pulc Petr Pulc Petr Pulc (Gar.)	Z	3	2P	Z	PP
BIE-TZP.21	Technological Fundamentals of Computers  Martin Novotný, Kateřina Hyniová, Matúš Olekšák Martin Novotný Martin Novotný (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-UOS.21	Unix-like Operating Systems Jan Trdlička, Zdeněk Muzikář, Jakub Žitný <b>Zdeněk Muzikář</b> Zdeněk Muzikář (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-PSI.21	Computer Networks Yelena Trofimova, Michal Polák <b>Yelena Trofimova</b> Yelena Trofimova (Gar.)	Z,ZK	5	2P+1R+1C	L	PP
BIE-SAP.21	Computer Structures and Architectures Petr Fišer, Hana Kubátová Petr Fišer Petr Fišer (Gar.)	Z,ZK	5	2P+1R+2C	L	PP
BIE-DBS.21	Database Systems Josef Pavlíček, Otto Šleger, Martin Urbanec Josef Pavlíček Josef Pavlíček (Gar.)	Z,ZK	5	2P+2R+1L	L	PP
BIE-MA1.21	Mathematical Analysis 1 Antonella Marchesiello Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	5	2P+1R+1C	L	PP
BIE-PA2.21	Programming and Algorithmics 2  Jan Trávníček, Ladislav Vagner, Radek Hušek, Josef Vogel Jan Trávníček  Jan Trávníček (Gar.)	Z,ZK	7	2P+1R+2C	L	PP
		Min. předm.				
DIE 1/0004	Purely Elective Bachelor Courses, Version 2021 till 2024/25	0	Min/Max			
BIE-V.2021	BIE-ZUM,BIE-ZRS, (pokračování viz seznam skupin níže)	Max. předm.	0/55			V
		15				

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-AG1.21	Algorithms and Graphs 1 Radek Hušek, Tomáš Valla, Ondřej Suchý, Michal Opler, Dušan Knop, Jan Volec <b>Dušan Knop</b> Dušan Knop (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-AAG.21	Automata and Grammars Jan Holub Jan Holub (Gar.)	Z,ZK 5 2P+2C		2P+2C	Z	PP
BIE-MA2.21	Mathematical Analysis 2 Antonella Marchesiello Tomáš Kalvoda Antonella Marchesiello (Gar.)	Z,ZK 6		3P+2C	Z	PP
BIE-APS.21	Architectures of Computer Systems Pavel Tvrdík, Michal Štepanovský Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	5	2P+2C	Z	PS
BIE-IDO.21	Introduction to DevOps Zdeněk Rybola, Tomáš Vondra, Jakub Jabůrek <b>Tomáš Vondra</b> Zdeněk Rybola (Gar.)	Z,ZK	5	2P+2C	Z	PS
		Min. předm.				
DIE V.0001	Purely Elective Bachelor Courses, Version 2021 till 2024/25	0	Min/Max			
BIE-V.2021	BIE-ZUM,BIE-ZRS, (pokračování viz seznam skupin níže)	Max. předm.	0/55			V
		15				

Číslo semestru: 4

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejích členů) Vyučující, autoři a garanti (gar.)	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-KAB.21	Cryptography and Security František Kovář, Ivana Trummová, Róbert Lórencz, Jiří Buček, Josef Kokeš, Martin Jureček, Jaroslav Kříž, David Pokorný, Filip Kodýtek <b>Jiří Buček</b> Róbert Lórencz (Gar.)	Z,ZK	5	2P+2C	L	PP
BIE-OSY.21	Operating Systems Jan Trdlička, Pavel Tvrdík, Michal Štepanovský Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	5	2P+1R+1L	L	PP
BIE-VPS.21	Selected Topics in Computer Networking Alexandru Moucha, Mohamed Bettaz Pavel Tvrdík Mohamed Bettaz (Gar.)	Z,ZK	5	2P+2C	L	PS
BIE-ADU.21	Unix Administration Zdeněk Muzikář, Petr Zemánek Petr Zemánek (Gar.)	Z,ZK	5	2P+2C	L	PS
BIE-VDC.21	Virtualization and Data Centers  Jiří Kašpar Jiří Kašpar Jiří Kašpar (Gar.)	Z,ZK	5	2P+2C	L	PS
		Min. předm.				
DIE Mood	Purely Elective Bachelor Courses, Version 2021 till 2024/25	0	Min/Max			
BIE-V.2021	BIE-ZUM,BIE-ZRS, (pokračování viz seznam skupin níže)	Max. předm.	0/55			V
		15				

Číslo semestru: 5

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejích členů) Vyučující, autoři a garanti (gar.)	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-BPR.21	Bachelor Project Zdeněk Muzikář Zdeněk Muzikář (Gar.)	Z	1		Z,L	PP
BIE-PST.21	Probability and Statistics Francesco Dolce Pavel Hrabák Francesco Dolce (Gar.)	Z,ZK 5 2P+2C		Z	PP	
BIE-SPS.21	Administration of Computer Networks and Services Libor Dostálek, Jan Kubr, Ondřej Slavík Pavel Tvrdík Libor Dostálek (Gar.)	Z,ZK	Z,ZK 5 2P+2S		Z	PS
BIE-ZSB.21	Basics of System Security Jiří Buček, Simona Fornůsek, Marián Svetlík, Martin Šutovský Simona Fornůsek Simona Fornůsek (Gar.)	Z,ZK 5 2P+2		2P+2C	Z	PS
BIE-AWD.21	Web and Database Server Administration Lukáš Bařinka, Michal Valenta Lukáš Bařinka Michal Valenta (Gar.)	Z,ZK	5	2P+2C	Z	PS
		Min. předm.				
DIE Massa	Purely Elective Bachelor Courses, Version 2021 till 2024/25	0	Min/Max			
BIE-V.2021	BIE-ZUM,BIE-ZRS, (pokračování viz seznam skupin níže)	Max. předm.	0/55			V
		15				

Číslo semestru: 6

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kódů jejích členů) Vyučující, autoři a garanti (gar.)	Zakončení	Kredity	Rozsah	Semestr	Role
BIE-BAP.21	Bachelor Thesis Zdeněk Muzikář Zdeněk Muzikář Zdeněk Muzikář (Gar.)	Z	14		L,Z	PP
BIE-TDP.21	Documentation and Presentation Dana Vynikarová Dana Vynikarová (Gar.)	KZ	3	2P+2C	Z,L	PP
BIE-EEC	English language external certificate Zdeněk Muzikář <b>Zdeněk Muzikář</b> Zdeněk Muzikář (Gar.)	Z	4	2D	L	PP
BIE-PV-PV.21	Compulsory elective Courses of specialization Computer Systems and Virtualization, version 2021 BIE-TAB.21,BIE-BIG.21, (pokračování viz seznam skupin níže)	Min. předm. 1 Max. předm. 3	Min/Max 5/15			PV
BIE-V.2021	Purely Elective Bachelor Courses, Version 2021 till 2024/25 BIE-ZUM,BIE-ZRS, (pokračování viz seznam skupin níže)	Min. předm. 0 Max. předm. 15	Min/Max 0/55			V

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

Kód		Název skupiny před (specifikace v	lmětů a kódy č <u>viz zde neb</u> o n	elenů této skupiny předmětů (že seznam předmětů)	Zal	končení	Kredi	ty Rozsah	Semestr	Role
BIE-PV	'-PV.21			f specialization Computer	Min	. předm. 1 . předm. 3	Min/M			PV
BIE-TAB.21	Application	l ns of Security in Tech	BIE-BIG.21	DB Technologies for Big Data		BIE-VES		Embedded Sy	ll stems	
BIE-V	.2021	Purely Elective Ba	chelor Course	s, Version 2021 till 2024/25		předm. 0 . předm.	Min/M			v
BIE-ZUM	Artificial In	telligence Fundamen	BIE-ZRS	Basics of System Control		15 TBIE-CCN	ı	Compiler Con:	struction	
BIE-SCE1		Engineering Seminar I	BIE-SCE2	Computer Engineering Seminar II		BIE-CZ0		Czech Langua		ers
BIE-CZ1.21	<u> </u>	guage for Foreigners II	UKCJP	Čeština pro pokročilé		BIE-DIF		Differential eq	0 0	
BIE-EPR	Economic	project	BIE-FTR.1	Financial Markets		BIE-HAS		Human Factor	s in Cryptogra	ohy an
BIE-CSI	Introductio	n to Computer Science	BIE-EHD	Introduction to European Economi		FITE-EH	D	Introduction to	European Eco	nomi
BIE-IMA	Introductio	n to Mathematics	BIE-IMA2	Introduction to Mathematics 2		BIE-ST1		Network Techr	nology 1	
BIE-PKM	Preparator	y Mathematics	BIE-PJV	Programming in Java		BIE-PS2		Programming	in shell 2	
FIT-ACM1	Programov	ací praktika 1	FIT-ACM2	Programovací praktika 2		FIT-ACM	3	Programovací	praktika 3	
FIT-ACM4	Programov	ací praktika 4	FIT-ACM5	Programovací praktika 5		FIT-ACM	6	Programovací	praktika 6	
BIE-PRR.21	Project ma	nagement	BIE-SKJ.21	Scripting Languages		BIE-VAK	.21	Selected Com	binatorics App	licati
BIE-VMM	Selected M	Mathematical Methods	BI-SCE1	Seminář počítačového inženýrství		BIE-SEG	ì	Systems Engi	neering	
TVV	Tělesná vý	chova	TVV0	Tělesná výchova 0		TV2K1		Tělesná výcho	va 2	
TVKLV	Tělovýchov	ný kurz	BIE-TUR.21	User Interface Design		BIE-VR1	.21	Virtual reality		
BIE-ADW.1	Windows A	Administration	FITE-SEP	World Economy and Business		BIE-SEP		World Econom	ny and Busines	ss
BIE-3DT.1	3D Printing	<u></u>								

## Seznam předmětů tohoto průchodu:

Kód	Název předmětu	Zakončení	Kredity				
BI-SCE1	Seminář počítačového inženýrství I	Z	4				
Seminář počítačov	eho inženýrství je výběrový předmět pro studenty, kteří se chtějí zabývat hlouběji tématy číslicového návrhu, spolehlivosti a odolnost	i proti poruchám a	útokům. Ke				
studentům se v rán	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	ı jinou odbornou literaturou a/nebo práce v laboratořích KČN. Kapacita předmětu je omezena možnostmi učitelů semináře. Probíraná	témata jsou pro ka	ždý 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 2D						

BIE-AAG.21 Automata and Grammars Z,ZK 5 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.21 Unix Administration Z,ZK Students will learn the internal structure of the UNIX operating system, with the administration of its basic subsystems and with the security principles. They will understand the differences between user and administrator roles. They will get theoretical and practical knowledge of user management and administration, of users access rights, file systems, disk subsystems, processes, memory, network services and remote access, and in the areas of system deployment and virtualization. In the labs, they will verify the knowledge from the lectures on specific examples from practice. BIE-ADW.1 Windows Administration 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-AG1.21 Algorithms and Graphs 1 Z,ZK 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.21 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 the program. 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-AWD.21 Web and Database Server Administration 5 Students will get acquainted with the administration of database and web servers and services. They will be able to install, configure, operate, test, and backup complex database and web service systems. The principles will be demonstrated on the PostgreSQL relational database engine and Apache will be used as an example of a web server. BIE-BAP.21 **Bachelor Thesis** 14 BIE-BIG.21 DB Technologies for Big Data ΚZ Students will be introduced into the field of Big Data processing where nonrelational (NoSQL) database engines are typically used today. The course is focused practically so that after finishing the course students were able to choose suitable tools (mostly open source) and techniques, design and implement a simplest reproducible method of data processing (data collection, transformation/aggregation, presentation). Students get acquainted with various architectures for processing and storing big data. A theoretical foundation and presentation of individual technologies will be supplemented with specific case studies. BIE-BPR.21 7 1 **Bachelor Project** 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. **Compiler Construction** 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. Introduction to Computer Science **BIE-CSI** 2 This is an introductory class on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other fields but interested in computer science, high-school students, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The goal of the class is to introduce and relate basic principles of computer science for students to understand, early on, what computer science is, why things such as high-level programming languages and tools are done the way they are, and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer not just basic computer science questions but also questions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are interested in computer science more than expected, or even less than before. BIE-CZ0 Czech Language for Foreigners 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 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. **Database Systems** Students get acquainted with the architecture of the database engine and typical user roles. They learn to design the structure of a smaller data store (including integrity constraints) using a conceptual model and then implement them in a relational database engine. They get acquainted with the SQL language and also with its theoretical basis - relational database model. They will get acquainted with the principles of relational database schema normalization. They understand the basic concepts of transaction processing and control of parallel user access to a single data source. At the end of the course, students will be introduced to alternative nonrelational database models. BIE-DIF Differential equations Z,ZK This course provides a foundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essential solution methods like separation of variables. Key theorems on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered with methods like characteristic polynomial analysis, followed by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world applications. Finally, an introduction to partial differential equations (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODEs and PDEs, including implicit and explicit Euler methods, Runge-Kutta methods, and finite element methods for both ODEs and PDEs. BIE-DML.21 Discrete Mathematics and Logic Students will get acquainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts from set theory will be explained. Special attention is paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The course also lays down the basics of combinatorics and number theory, with emphasis on modular arithmetics. **BIE-EEC** English language external certificate 4 The BIE-ECC course can be recognized for any active semester after the submission of a certificate certificate that demonstrates their proficiency in English comparable to or exceeding the B2 level of the Common European Framework of Reference for Languages. **BIE-EHD** Introduction to European Economic History 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 ever history. Class meetings will consist of a mixture of lectures and discussions.	ts, institutions and organ	nizations in
BIE-EPR  Economic project  This course is an extension of the course Introduction to European Economic History (BIE-EHD).	Z	1
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 views.	ew on the issue of credit	
globalization of market activities. The need to use and properly apply mathematical and technical tools is emphasized. To manage their financial at		
from technical schools who have sufficient knowledge ICT and mathematics, and who have at the same time an understanding of the functioning  Markets course thus englobes both a description of financial markets and related economic theories, and an overview of mathematical and st		
BIE-GIT.21 SW Development Technologies	Z	3
This course is aimed at one of the rudimental team software development technology - version control. To be more specific, we will introduce stude		n manager
from hell, as Linus Torvalds nicknamed it, and provide a comprehensive guide into its depths, as well as for day-to-day	·	5
BIE-HAS   Human Factors in Cryptography and Security Předmět je určen studentům, které zajímá nejen matematická a technická stránka věci, ale i přemýšlení nad tím, jestli výsledný produkt bude použitelr	Z,ZK Z,on judi (od těch, kteří in	-
šifry po uživatele aplikací). Studenti budou moci využít nabyté vědomosti z tohoto kurzu k návrhu, plánování a analýze svých vlastních projektů v		
zaměřené na člověka.		
BIE-IDO.21   Introduction to DevOps The course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of the course developers and developers and developers and developers and developers are considered as the course of	Z,ZK	5 The course
covers the tools to support software development, testing and compilation. It also focuses on tools for automating infrastructure management and	-	
the Cloud. It is an introduction to technologies that will then be discussed in more detail in related follow-up courses. The student will also get acc	uainted with modern tec	hnologies
used in practice.		
BIE-IMA   Introduction to Mathematics Students refresh and extend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they	are able to apply them it	4 n particular
examples.	are able to apply arom	partiouiai
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 examples.	are able to apply them in	n particular
BIE-KAB.21 Cryptography and Security	Z,ZK	5
Students will understand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be a	1 ' 1	
certificates in systems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in	* *	
will gain practical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proceded expected to be competent programmers in C/C++ (on a small scale). Basic Python knowledge is an advantage		idents are
BIE-LA1.21 Linear Algebra 1	Z,ZK	5
We will introduce students to the basic concepts of linear algebra, such as vectors, matrices, vector spaces. We will define vector spaces over the	1 '	x numbers
and also over finite fields. We will present the concepts of basis and dimension and learn to solve systems of linear equations using the Gaussian of the concepts of the concepts of basis and dimension and learn to solve systems of linear equations using the Gaussian of the concepts of basis and dimension and learn to solve systems of linear equations using CEM. We will also learn to find their inversions using CEM. We will also learn to find their inversions using CEM. We will also learn to find their inversions using CEM.	·	
the connection with linear manifolds. We define the regularity of matrices and learn to find their inversions using GEM. We will also learn to find a matrix. We will also demonstrate some applications of these concepts in computer science.	agenvalues and eigenver	CIOIS OI a
BIE-MA1.21 Mathematical Analysis 1	Z,ZK	5
We begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers and its properties, and we note its differences with the set of machine numbers and functions of a real variable. We gradually introduce the nations of limits of a gradually instances and functions and functions and functions and deviations and		-
and real functions of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of list then applied to root-finding problems (iterative method of bisection and Newtons method), construction of cubic interpolation (spline), and formulation		
problems (i.e., the issue of finding extrema of functions). The course is closed with the Landaus asymptotic notation and methods of mathematical de-	<u>-</u>	· -
BIE-MA2.21 Mathematical Analysis 2	Z,ZK	6
The course completes the theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students and use the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylors theore		
functions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithm	=	=
theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient,		-
analytical method of localization of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the BIE-OSY.21  Operating Systems		e functions.
BIE-OSY.21   Operating Systems In this course that is a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and three	Z,ZK   ad implementations. race	
critical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS		
and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or I		
BIE-PA1.21 Programming and Algorithmics 1	Z,ZK	7
	Z,ZK uctured), expressions, st	atements,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundsorting, and manipulating linked lists and trees.	Z,ZK uctured), expressions, st	atements, earching,
BIE-PA1.21   Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21   Programming and Algorithmics 2	Z,ZK uctured), expressions, st amental algorithms for se	eatements, earching,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundsorting, and manipulating linked lists and trees.	Z,ZK uctured), expressions, st amental algorithms for se	ratements, earching,  7 ray, list, set,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21 Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stactable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming copying/moving of objects, operator overloading, inheritance, polymorphism).	Z,ZK uctured), expressions, st amental algorithms for se Z,ZK k, queue, enlargeable arring (e.g., template progra	ratements, earching,  7 ray, list, set,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21 Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming copying/moving of objects, operator overloading, inheritance, polymorphism).  BIE-PJV Programming in Java	Z,ZK uctured), expressions, st amental algorithms for se Z,ZK k, queue, enlargeable arraing (e.g., template progra	7 ray, list, set, amming,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21 Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming copying/moving of objects, operator overloading, inheritance, polymorphism).  BIE-PJV Programming in Java The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java	Z,ZK uctured), expressions, st amental algorithms for se Z,ZK k, queue, enlargeable arraing (e.g., template progra	7 ray, list, set, amming,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21 Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming copying/moving of objects, operator overloading, inheritance, polymorphism).  BIE-PJV Programming in Java	Z,ZK uctured), expressions, st amental algorithms for se Z,ZK k, queue, enlargeable arraing (e.g., template progra	7 ray, list, set, amming,
BIE-PA1.21   Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21   Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programmic copying/moving of objects, operator overloading, inheritance, polymorphism).  BIE-PJV   Programming in Java The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.  BIE-PKM   Preparatory Mathematics The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathematics	Z,ZK uctured), expressions, st amental algorithms for se Z,ZK k, queue, enlargeable arraing (e.g., template progra Z,ZK ava language the fundam	atements, earching,  7 ray, list, set, amming,  4 nental APIs
BIE-PA1.21   Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21   Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming of objects, operator overloading, inheritance, polymorphism).  BIE-PJV   Programming in Java The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.  BIE-PKM   Preparatory Mathematics The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathematics  BIE-PRR.21   Project management	Z,ZK uctured), expressions, st amental algorithms for set amental algorithms for set amental algorithms for set are z,ZK k, queue, enlargeable arring (e.g., template programa z,ZK ava language the fundam z anatics.	7 ray, list, set, amming, 4 nental APIs 4
BIE-PA1.21   Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21   Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming of objects, operator overloading, inheritance, polymorphism).  BIE-PJV   Programming in Java The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.  BIE-PKM   Preparatory Mathematics The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathematics  The purpose is to introduce students into the basic concepts and principles of project management, i.e. methods of planning, teamworks.	Z,ZK uctured), expressions, st amental algorithms for set amental algorithm	atements, earching,  7 ray, list, set, amming,  4 nental APIs  4
BIE-PA1.21   Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21   Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming of objects, operator overloading, inheritance, polymorphism).  BIE-PJV   Programming in Java The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.  BIE-PKM   Preparatory Mathematics The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathematics BIE-PRR.21   Project management	Z,ZK uctured), expressions, st amental algorithms for set amental algorithm	7 ray, list, set, amming, 4 nental APIs 4 5 ement in a nagement,
BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, str and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fund sorting, and manipulating linked lists and trees.  BIE-PA2.21 Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stact table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming of objects, operator overloading, inheritance, polymorphism).  BIE-PJV Programming in Java The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Javill also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.  BIE-PKM Preparatory Mathematics  The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathem  BIE-PRR.21 Project management  The aim of the course is to introduce students into the basic concepts and principles of project management, i.e. methods of planning, teamwork project, communication, argumentation and meeting management. Students will practice project management techniques (e.g. SWOT analysis, r	Z,ZK uctured), expressions, st amental algorithms for seamental algorit	atements, earching,  7 ray, list, set, amming,  4 nental APIs  4  5 ement in a nagement, erested in

BIE-PS2 Programming in shell 2 Z,ZK 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, In, 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.21 Computer Networks Z,ZK 5 The course introduces students to the principles of computer networking. It covers basic technologies, protocols, and services commonly used in local networks and in the Internet as well. The lectures will be amended by proseminars that introduce students into network programming and demonstrate the abilities of advanced network technologies. Students practically verify configurations and management of network devices in the lab within the environment of the operating systems Linux and Cisco IOS. BIE-PST.21 Probability and Statistics 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 for testing statistical hypotheses and determining the statistical dependence of two or more random variables. BIE-SAP.21 Computer Structures and Architectures Z,ZK 5 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. Computer Engineering Seminar I 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 KČN 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 Ζ 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 KČN laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each semester. **BIE-SEG** Systems Engineering This is an introductory class on systems engineering for bachelor students in computer science. The goal of the class is to introduce basic principles of operating systems for students to understand processor and memory virtualization. Seeing and actually understanding virtualization is the overarching theme of the class. After taking the class, students are able to understand the difference between processes and threads as well as emulation and virtualization, what virtual memory is and how it works, what concurrency is, as opposed to parallelism, and how processes and threads synchronize efficiently to overcome concurrency for communication. **BIE-SEP** World Economy and Business 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 Scripting Languages Join us on a tour into the world of scripted programming. Together, we will unveil the power of Bourne Again shell and PERL as proven industry standards, as well as a couple of other standard text processing utilities (AWK, sed), with some basic UNIX system tools, in many real-world situations like processing web feeds or logs. We will provide a general overview of scripting languages and introduction into their pros and cons and students get practical experience with shell script programming. We will touch also ROFF, PerlDoc, and even TeX to get some insight into how your code documentation can be implemented. And if you know UNIX system-level scripting already, we can show you advanced programming techniques and tricks that get overlooked frequently but increase code robustness or execution efficiency. The course is led by two veteran programmers in the scripting world. Lukáš is a renowned lecturer in advanced shell programming, teaching developers from the IT industry in several CE countries. Jan is a skilled lecturer and developer whose code contributes to safe and streamline operations of cloud service datacenters around the globe. BIE-SPS.21 Administration of Computer Networks and Services Z.ZK 5 The aim of the course is to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrated under the operating systems Linux and Windows. The course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained by practical hands-on experience with real network infrastructure. BIE-ST1 Network Technology 1 Ζ 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-TAB.21 Applications of Security in Technology 5 The goal of the course is to introduce students to selected topics from cybersecurity technical applications that are utilized in different industries. Students get a broader overview of cybersecurity applications and extend their knowledge from the cryptology, the secure code, and system, network, and hardware security. BIE-TDP.21 **Documentation and Presentation** The course is focused on the basics of creating electronic documentation with emphasis on the creation of technical reports of a larger scope, typically final university theses. Students learn to create text of a technical report in the LaTeX system, process an electronic presentation using the LaTeX Beamer system, and practically present it in front of classmates and the teacher. The course is intended primarily for those students who have chosen the topic of their bachelor's thesis or will choose it within the first 14 days of teaching. Within the exercises of the course, an active approach to the creation of individual parts of the bachelor's thesis is assumed. BIE-TUR.21 User Interface Design Z,ZK 5 Students gain a basic overview of methods for designing and testing common user interfaces. They get experience to solve the problems where software and other products do not communicate with the user optimally, since the needs and characteristics of users are not taken into account during product development. Students gain an overview of methods that bring users into the development process to ensure optimal interface for them. BIE-TZP.21 Technological Fundamentals of Computers Z,ZK Students get acquainted with the fundamentals of digital and analog circuits, as well as basic methods of analyzing them. Students learn how computer structures look like at the lowest level. They are introduced to the function of a transistor. They will understand why processors generate heat, why cooling is necessary, and how to reduce the consumption; what the limits to the maximum operating frequency are and how to raise them; why a computer bus needs to be terminated, what happens if it is not; how a computer power supply looks like (in principle). In the labs, students model the behavior of basic electrical circuits in SW Mathematica. BIE-UOS.21 Unix-like Operating Systems ΚZ Unix-like operating systems represent a large family mostly open-source codes that kept bringing during the history of computers efficient innovative functions of multiuser operating systems for computers and their networks and clusters. The most popular OS today, Android, has a unix kernel. Students get overview of basic properties of this OS family, such as

processes and threads, access rights and user identity, filters, or handling files in a file system. They learn to use practically these systems at the level of advanced users who are not only able to utilize powerful system tools that are available to users, but are also able to automatize routine agenda using the unix scripting interface, called shell. BIE-VAK.21 Selected Combinatorics Applications 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-VDC.21 Virtualization and Data Centers The aim of the course is to familiarize students with technology basis of cloud computer systems. It shows principles and techniques used in design and implementation of data center infrastructure, such as various kinds of virtualization and high availability of servers, storages, and software layers. The course guides through data center technologies from private to public and hybrid clouds. Student learn current trends in the architecture of IT infrastructure and its configuration for classic and cloud applications. Students will understand the design, validation, and operation of complex infrastructures for modern applications with respect to scalability and protection against overloads, outages, and data losses. **BIE-VES Embedded Systems** Z,ZK 5 Students learn to design embedded systems and develop software for them. They get basic knowledge of the most common microcontrollers and embedded processors, their integrated peripheral circuits, programming methods, and applications. They get practical skills with development kits and tools. **BIE-VMM** Selected Mathematical Methods The lecture begins with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then address Fourier series and their properties. Further, we introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the wavelet transform. We examine the linear programming problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. BIE-VPS.21 Selected Topics in Computer Networking The course builds upon the Computer Networks course (BI-PSI), obligatory for the program. Students will learn in detail principles, protocols, and technologies used in modern computer networks from local area networks up to Internet, with focus on switching, routing, security, and virtualization. The emphasis will be on gaining practical experience with real network devices in the lab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, and security. **BIE-VR1.21** Virtual reality I Introduction to Virtual Reality (VR), virtual reality operations, metaverse, and creation. Rules and requirements for virtual worlds communication. The course focuses on the ways of creating virtual reality worlds and interactive activities in 3D worlds. It improves computational thinking, empathy, and shared social activities **BIF-7RS** 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 užitečných příkladů a praktických průmyslových realizací. BIE-ZSB.21 Basics of System Security The goal of the course is to provide introduction to basic concepts in security of computer systems. Further, the course introduces the basics of forensic analysis and related topics such as malware analysis or incident response. After finishing the course student will get both theoretical and practical knowledge in the area of modern operating systems security, as well as skills needed for independent work in the area of operating system security incident analysis. BIF-7UM Artificial Intelligence Fundamentals Z,ZK 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. FIT-ACM1 Programovací praktika 1 ΚZ 5 Tento výběrový kurz má za cíl připravit ty nejlepší studenty na reprezentaci fakulty v rámci mezinárodních ACM soutěží FIT-ACM2 ΚZ Programovací praktika 2 5 Tento výběrový kurz má za cíl připravit ty nejlepší studenty na reprezentaci fakulty v rámci mezinárodních ACM soutěží FIT-ACM3 Programovací praktika 3 ΚZ 5 Tento výběrový kurz má za cíl připravit ty nejlepší studenty na reprezentaci fakulty v rámci mezinárodních ACM soutěží. FIT-ACM4 Programovací praktika 4 ΚZ 5 Tento výběrový kurz má za cíl připravit ty nejlepší studenty na reprezentaci fakulty v rámci mezinárodních ACM soutěží. FIT-ACM5 Programovací praktika 5 ΚZ 5 Tento výběrový kurz má za cíl připravit ty nejlepší studenty na reprezentaci fakulty v rámci mezinárodních ACM soutěží. FIT-ACM6 Programovací praktika 6 ΚZ 5 Tento výběrový kurz má za cíl připravit ty nejlepší studenty na reprezentaci fakulty v rámci mezinárodních ACM soutěží. FITE-EHD Introduction to European Economic History 7 7K 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. FITE-SEP World Economy and Business 7.7K 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 TV2K1 Tělesná výchova 2 1 TVKLV Ζ 0 Tělovýchovný kurz Z TVV Tělesná výchova 0 TVV0 Tělesná výchova 0

UKCJP Čeština pro pokročilé Z,ZK 2
Kurz pokročilé češtiny pro ukrajinské studenty, kteří mají status uprchlíka. Zkouška potvrdí znalost češtiny na úrovní B2 s platností pro ČVUT.

Aktualizace výše uvedených informací naleznete na adrese <a href="http://bilakniha.cvut.cz/cs/FF.html">http://bilakniha.cvut.cz/cs/FF.html</a> Generováno: dne 29.11.2025 v 10:48 hod.