Recomended pass through the study plan

Name of the pass: Bachelor specialization Information Security, part-time, in Czech, 2021

Faculty/Institute/Others:

Department:

Pass through the study plan: Bachelor Specialization Information Security, part-time, in Czech, 2021

Branch of study guranteed by the department: Welcome page

Guarantor of the study branch: Program of study: Informatika Type of study: Bachelor combined

Note on the pass: Vedle ist volitelných p edm t si m žete zapsat jako volitelné p edm ty i povinné p edm ty sousedních specializací. Chcete-li splnit skupinu "BI-ZKA.21 Zkouška z angli tiny 2021" p edložením certifikátu, který prokazuje vaši znalost angli tiny srovnatelnou nebo p evyšující úrove B2 Spole ného evropského referen ního rámce pro jazyky, m žete tak u init v kterémkoliv aktivním semestru b hem studia.

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BIK-DML.21	Discrete Mathematics and Logic Eva Pernecká Eva Pernecká Eva Pernecká (Gar.)	Z,ZK	5	14KP+4KC	Z	PP
BIK-LA1.21	Linear Algebra 1 Karel Klouda Karel Klouda (Gar.)	Z,ZK	5	14KP+4KC	Z	PP
BIK-PA1.21	Programming and Algorithmics 1 Radek Hušek, Josef Vogel, Ladislav Vagner, Jan Trávní ek Jan Trávní ek (Gar.)	Z,ZK	7	14KP+8KC	Z	PP
BIK-TZP.21	Technological Fundamentals of Computers Martin Da hel, Kate ina Hyniová Martin Da hel Martin Da hel (Gar.)	Z,ZK	5	14KP+4KC	Z	PP
BIK-GIT.21	SW Development Technologies Petr Pulc Petr Pulc Petr Pulc (Gar.)	Z	3	14KP	Z	PP
BIK-UOS.21	Unix-like Operating Systems Petr Zemánek, Jakub Žitný Petr Zemánek Petr Zemánek (Gar.)	KZ	5	14KP+4KC	Z	PP

Number of semester: 2

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BIK-DBS.21	Database Systems Monika Borkovcová	Z,ZK	5	14KP+6KC	L	PP
BIK-MA1.21	Mathematical Analysis 1 Ivo Petr	Z,ZK	5	14KP+4KC	_	PP
BIK-PSI.21	Computer Networks Vladimír Smotlacha	Z,ZK	5	14KP+4KC	L	PP
BIK-PA2.21	Programming and Algorithmics 2 Jan Trávní ek	Z,ZK	7	14KP+6KC	L	PP
BIK-SAP.21	Computer Structure and Architecture Martin Da hel	Z,ZK	5	14KP+6KC	L	PP
		Min. cours.				
Duchass	ist volitelné p edm ty bakalá ského programu, kombinovaná forma výuky, verze 2021 až 2024	0	Min/Max			
BIK-V.2021	kombinovaná forma výuky, verze 2021 až 2024 BIK-ADW.1,BIK-STO, (see the list of groups below)	Max. cours.	0/31			V
		8				

Number of semester: 3

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BIK-AG1.21	Algorithms and Graphs 1 Radek Hušek, Dušan Knop Dušan Knop (Gar.)	Z,ZK	5	14KP+4KC	Z	PP
BIK-AAG.21	Automata and Grammars Jan Janoušek, Jan Holub Jan Holub Jan Holub (Gar.)	Z,ZK	5	14KP+4KC	Z	PP
BIK-MA2.21	Mathematical Analysis 2 Petr Olšák Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	6	21KP+4KC	Z	PP
BIK-APS.21	Architectures of Computer Systems Michal Štepanovský Michal Štepanovský (Gar.)	Z,ZK	5	14KP+4KC	Z	PS
BIK-UKB.21	Introduction to Cybersecurity	Z,ZK	5	21KP+2KC	Z	PS
		Min. cours.				
BIK-V.2021	ist volitelné p edm ty bakalá ského programu, kombinovaná forma výuky, verze 2021 až 2024	0	Min/Max			V
DIN-V.2U21	BIK-ADW.1,BIK-STO, (see the list of groups below)	Max. cours.	0/31			V
		8				

Number of semester: 4

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BIK-KAB.21	Cryptography and Security Róbert Lórencz	Z,ZK	5	14KP+4KC	; L	PP
BIK-OSY.21	Operating Systems Michal Soch	Z,ZK	5	14KP+4KC	L	PP
BIK-ADU.21	Unix Administration Petr Zemánek	Z,ZK	5	14KP+4KC	L	PS
BIK-BEK.21	Secure Code Josef Kokeš	Z,ZK	5	14KP+4KC	L	PS
BIK-EHA.21	Ethical Hacking Ji í Dostál	Z,ZK	5	14KP+4KC	L	PS
		Min. cours.				
DUC \ (0004	ist volitelné p edm ty bakalá ského programu,	0	Min/Max			
BIK-V.2021	kombinovaná forma výuky, verze 2021 až 2024 BIK-ADW.1,BIK-STO, (see the list of groups below)	Max. cours.	0/31			V
		8				

Number of semester: 5

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BIK-BPR.21	Bachelor project Zden k Muziká Zden k Muziká Zden k Muziká (Gar.)	Z	1		Z,L	PP
BIK-PST.21	Probability and Statistics Daniel Vašata Pavel Hrabák Pavel Hrabák (Gar.)	Z,ZK	5	14KP+4KC	Z	PP
BIK-ASB.21	Applied Network Security Ji í Dostál	Z,ZK	5	14KP+4KC	Z	PS
BIK-HWB.21	Hardware Security Ji í Bu ek	Z,ZK	5	14KP+4KC	Z	PS
BIK-ZSB.21	Basics of System Security Ji í Dostál, Marián Svetlík Ji í Dostál Marián Svetlík (Gar.)	Z,ZK	5	14KP+4KC	Z	PS
BIK-V.2021	ist volitelné p edm ty bakalá ského programu, kombinovaná forma výuky, verze 2021 až 2024 BIK-ADW.1,BIK-STO, (see the list of groups below)	Min. cours. 0 Max. cours. 8	Min/Max 0/31			V

Number of semester: 6

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BI-BAP.21	Bachelor Thesis Zden k Muziká	Z	14		L,Z	PP

BIK-TDP.21	Documentation and Presentation Tomáš Nová ek, Dana Vynikarová Tomáš Nová ek Dana Vynikarová (Gar.)	KZ	3	14KP+4KC	Z,L	PP
BIK-IB-PV.21	Povinn volitelné p edm ty specializace Informa ní bezpe nost, kombinovaná forma, verze 2021 BIK-TAB.21,BIK-VES, (see the list of groups below)	Min. cours. 1 Max. cours. 3	Min/Max 5/15			PV
BI-ZKA.21	Zkouška z angli tiny 2021 BI-ANG1,BIE-EEC, (see the list of groups below)	Min. cours. 1 Max. cours. 1	Min/Max 2/4			PJ
BIK-V.2021	ist volitelné p edm ty bakalá ského programu, kombinovaná forma výuky, verze 2021 až 2024 BIK-ADW.1,BIK-STO, (see the list of groups below)	Min. cours. 0 Max. cours. 8	Min/Max 0/31			V

List of groups of courses of this pass with the complete content of members of individual groups

Kód		Name of the group of group (for specification	courses and on see here o	codes of members of this r below the list of courses)	Com	pletion	Credit	s Scope	Semester	Role
BI-ZK/	A.21	Zko	uška z angli d	tiny 2021		cours. 1 cours. 1	Min/M a 2/4	ax		PJ
BI-ANG1	English La	nguage Examination wit	BIE-EEC	English language external certif		BI-ANG		English Langu	age, Internal (Certi
BIK-IB-	PV.21	Povinn volitelné bezpe nost, l	p edm ty sp combinovaná	ecializace Informa ní forma, verze 2021		cours. 1 . cours. 3	Min/M : 5/15			PV
BIK-TAB.21	Application	ns of Security in Tech	BIK-VES	Embedded Systems		BIK-ZUM	.21	Artificial Intelli	gence Fundan	nen
BIK-V.	2021	ist volitelné p kombinovaná	edm ty bak forma výuky,	alá ského programu, verze 2021 až 2024		cours. 0 . cours. 8	Min/M a 0/31	ax		v
BIK-ADW.1	Windows A	Administration	BIK-STO	Storage and Filesystems		BIE-DIF		Differential eq	uations	
BIK-EJA	Enterprise	Java	BIK-HMI	History of Mathematics and Infor		BIK-SQL	.1	Language SQ	L	
BIK-OOP.21	Object-Orio	ented Programming	BIK-PJV	Programming in Java		BIK-PRR	.21	Project manaç	gement	
BIK-PKM	Introductio	n to Mathematics	BIK-TAB.21	Applications of Security in Tech		TVV		Physical educ	ation	
TV1	Physical E	ducation	TVV0	Physical education		TV2K1		Physical Educ	ation 2	
BIK-TUR.21	User Interf		BIK-KSA	Cultural and Social Anthropology		BIK-ZWL		Introduction to	147 1 111	

List of courses of this pass:

Code	Name of the course	Completion	Credits
BI-ANG	English Language, Internal Certificate	ZK	2
'	Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN	Ğ	
BI-ANG1	English Language Examination without Preparatory Courses	Z,ZK	2
BI-BAP.21	Bachelor Thesis	Z	14
BIE-DIF	Differential equations	Z,ZK	5

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-EEC	English language external certificate	Z	4
	se can be recognized for any active semester after the submission of a certificate certificate that demonstrates their proficiency in English		
DIIC A A O O4	the B2 level of the Common European Framework of Reference for Languages.	7 71/	
BIK-AAG.21	Automata and Grammars uced to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite au	Z,ZK	5 everession
	ars, translation finite automata, construction and use of pushdown automata, hierarchy of formal languages. Knowledge acquired thro		
DIK VDITO1	to creation of algorithms for pattern matching, data compression, translation, simple parsing, and creation of digital circuits.	7 71/	
3IK-ADU.21	Unix Administration he internal structure of the UNIX operating system, with the administration of its basic subsystems and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and with the security principles. They we shall be a continuous and the con	Z,ZK	5
	administrator roles. They will get theoretical and practical knowledge of user management and administration, of users access rights, fi		
	ory, network services and remote access, and in the areas of system deployment and virtualization. In the labs, they will verify the known specific examples from practice.	=	·=
BIK-ADW.1	Windows Administration	Z,ZK	4
DIT NOW.1	This course is presented in Czech.	2,21	1 -
BIK-AG1.21	Algorithms and Graphs 1	Z.ZK	5
	esented in Czech. The course covers the basics from the efficient algorithm design, data structures, and graph theory, belonging to the	e core knowledg	e of every
mputing curriculu	m. Students learn techniques of proofs of correctness of algorithms and techniques of asymptotic mathematics for estimation of their	complexity in the	best, wors
average case (the	e course includes basics from probability theory needed for understanding randomized algorithms). Within exercises students learn appl	lications of studie	ed algorithr
DU	for solving practical problems.	7 71	
BIK-APS.21	Architectures of Computer Systems	Z,ZK	5
	n the construction principles of internal architecture of computers with universal processors at the level of machine instructions. Speci- n processing and on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the princi	-	
	processors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness of the content of the content of the correctness of t		•
-	e further elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory coherence.		
	systems.		•
BIK-ASB.21	Applied Network Security	Z,ZK	5
ne aim of the cou	rse is to introduce selected topics from computer networks in terms of cybersecurity. These topics extend the basic knowledge gained	l in course BI-PS	I with actu
security application	ons like the public key infrastructure, encrypted network protocols, link and network layer security or wireless networks. After finishing	the course stud	ent will get
	knowledge of security applications in computer networks.		_
BIK-BEK.21	Secure Code	Z,ZK	5
	arn how to assess security risks and how to take them into account in the design phase of their own code and solutions. After getting far		
-	gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every process. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securing demonstrated.	_	
=	leges. Dangers inherent in buner overnows will be practically demonstrated. Students will be introduced to the principles of securing d		
	database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the		-
	database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the		t them.
BIK-BPR.21	Bachelor project	defense agains Z	t them.
BIK-BPR.21 1. At the beginning	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the part of the semester is the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the part of the semester is the student reserves the topic of the bachelor's thesis and connects with the supervisor.	e defense agains Z artial tasks that	t them. 1 he / she wil
BIK-BPR.21 1. At the beginning erform during the	Bachelor project	defense agains Z artial tasks that le end of the sen	t them. 1 he / she winester. 2. T
BIK-BPR.21 1. At the beginning erform during the external supervisor	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the	e defense agains Z artial tasks that e end of the sen cz/student/studij	t them. 1 he / she winester. 2. The principle of the control of t
BIK-BPR.21 1. At the beginning erform during the sternal supervisor ne completed and	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the passemester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut.isigned form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the topinulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assign	e defense agains Z artial tasks that le end of the sencz/student/studijc of the work that	t them. 1 he / she will hester. 2. The strong of the students
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BIK-BPR.21 1. At the beginning efform during the eternal supervisor ne completed and as reserved is form BIK-DBS.21	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the passemester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut. signed form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the topi nulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assignment of the semester. Database Systems	e defense agains Z artial tasks that the e end of the second coz/student/studig c of the work that the end of the second control to the the end of the work that the end of th	t them. 1 ne / she wi nester. 2. Ti ni/formular at the stude e assignme
BIK-BPR.21 1. At the beginning efform during the external supervisor ne completed and as reserved is form BIK-DBS.21 Itudents get acqua	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the passemester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut. signed form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the topi nulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assign can be supplemented and approved at the end of the semester. Database Systems ainted with the architecture of the database engine and typical user roles. They learn to design the structure of a smaller data store (in	e defense agains Z artial tasks that the e end of the sen- cz/student/studij c of the work that the end of the sen- Z,ZK actuding integrity	t them. 1 ne / she wi nester. 2. T ni/formular at the stude e assignme 5 constraint
BIK-BPR.21 1. At the beginning efform during the eternal supervisor ne completed and as reserved is form BIK-DBS.21 Etudents get acquaining a conceptual	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the passemester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut. signed form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the topi nulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assign can be supplemented and approved at the end of the semester. Database Systems ainted with the architecture of the database engine and typical user roles. They learn to design the structure of a smaller data store (in model and then implement them in a relational database engine. They get acquainted with the SQL language and also with its theoretic	e defense agains Z artial tasks that the e end of the second control of the second control of the work that the the work the work that the work the	t them. 1 ne / she winester. 2. The stude a sasignment of the stude o
BIK-BPR.21 I. At the beginning efform during the eternal supervisor he completed and as reserved is form BIK-DBS.21 tudents get acquaing a conceptual	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the passemester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut. signed form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the topi nulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assign can be supplemented and approved at the end of the semester. Database Systems ainted with the architecture of the database engine and typical user roles. They learn to design the structure of a smaller data store (in model and then implement them in a relational database engine. They get acquainted with the SQL language and also with its theoretic acquainted with the principles of relational database schema normalization. They understand the basic concepts of transaction process.	e defense agains Z artial tasks that the e end of the sen- cz/student/studij c of the work that the expensive state of the sen- Z,ZK acluding integrity cal basis - relation essing and contribute.	t them. 1 ne / she wi nester. 2. The street of the stude
BIK-BPR.21 1. At the beginning erform during the external supervisor ne completed and as reserved is form BIK-DBS.21 Etudents get acquesing a conceptual godel. They will get	Bachelor project g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the passemester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut. signed form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the topinulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assignment of the supervisor for the semester should be aimed primarily at fine-tuning the assignment of the supervisor for the semester should be aimed primarily at fine-tuning the assignment of the supervisor for the semester. Database Systems ainted with the architecture of the database engine and typical user roles. They learn to design the structure of a smaller data store (in model and then implement them in a relational database engine. They get acquainted with the SQL language and also with its theoretic acquainted with the principles of relational database schema normalization. They understand the basic concepts of transaction procuser access to a single data source. At the end of the course, students will be introduced to alternative nonrelational database more access.	e defense agains Z artial tasks that the e end of the sendoz/student/studing to of the work that the expension of the e	t them. 1 ne / she will nester. 2. Th ni/formulare at the stude e assignme 5 constraints nal databa: rol of parall
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BIK-KSA Cultural and Social Anthropology ZK The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples from anthropological research from our culture as well as from the "exotic" ones (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc ...). The course is an interesting alternative to other humanities, taught at FIT. BIK-LA1.21 Z,ZK Linear Algebra 1 We will introduce students to the basic concepts of linear algebra, such as vectors, matrices, vector spaces. We will define vector spaces over the field of real and complex 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 elimination method (GEM) and show 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 eigenvalues and eigenvectors of a matrix. We will also demonstrate some applications of these concepts in computer science. BIK-MA1.21 Mathematical Analysis 1 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. Then we study real sequences and real functions of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This theoretical foundation is then applied to root-finding problems (iterative method of bisection and Newtons method), construction of cubic interpolation (spline), and formulation and solution of simple optimization problems (i.e., the issue of finding extrema of functions). The course is closed with the Landaus asymptotic notation and methods of mathematical description of complexity of algorithms. BIK-MA2.21 Mathematical Analysis 2 Z,ZK The course completes the theme of analysis of real functions of a real variable initiated in BIK-MA1 by introducing the Riemann integral. Students will learn how to integrate by parts and use the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylors theorem to the computation of elementary functions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Master theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the analytical method of localization of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of multivariate functions. This course can be enrolled only after successful completion of the course BIK-MA1, which can be replaced by the course BIK-ZMA in the case of repetitive students. BIK-OOP.21 Object-Oriented Programming 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 students get acquainted with the main principles of object-oriented programming and design, used in modern programming languages. The emphasis is on practical techniques for developing software, which includes testing, error handing, refactoring, and application of design pattern. BIK-OSY.21 Operating Systems 7.7K 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 thread implementations, race conditions, critical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. Programming and Algorithmics 1 Students gain the ability to formulate 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 to analyse simple cases of algorithm complexity. They know fundamental algorithms for searching, sorting, and manipulating with linked lists. 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 (stack, queue, enlargeable array, list, set, table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). **BIK-PJV** Programming in Java Z,ZK This course is presented in Czech. However, there is an English variant in the full-time program Informatics (B1801 / 4753). **BIK-PKM** Introduction to Mathematics Ζ 4 This course is presented in Czech. BIK-PRR.21 Project management Z.ZK 5 Project management not only as a common dictionary and setting necessary processes while preparing and / or managing projects, but also as a social art. 20 years of experience not only in IT in various positions and different projects available at your hands. BIK-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. BIK-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. BIK-SAP.21 Computer Structure and Architecture Z,ZK Students will get acquainted with the basic architecture and units of a digital computer, understand the structure, function, and implementation of arithmetic-logic unit, controllers, memory, I/O communication, methods of data transfers between the units. The logic design and the implementation of a program-controlled simple processor is practically implemented in the labs using programmable circuits (FPGA), a single-chip microcomputer, and modern design (EDA) tools. BIK-SQL.1 Language SQL ΚZ Course is based on knowledge obtained in BI-DBS. Students become familiar with advanced relational and non-relational features of SQL language. In particular stored program unites, triggers, recursive queries, OLAP support, object-relational constructions. Part of the course is dedicated to practical database optimization from the point of view of specialized database structures like indexes, clusters, index-organized tables, and materialized views. as well as from the point of view query optimization. Execution plan and possibilities of its. changes will be discussed. Lectures will usually discuss SQL standard, but many features will be demonstrated on Oracle DBMS. Seminars are based on Oracle DBMS and partially on PostgreSQL. **BIK-STO** Storage and Filesystems 4 The student will learn principles and current solutions of storage systems architecture. The module explains principles of data store, protection, and archiving, as so as storage scaling, load balancing and high availability. Z,ZK BIK-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. BIK-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. BIK-TUR.21 Z.ZK 5 User Interface Design 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. BIK-TZP.21 Technological Fundamentals of Computers 7 7K 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. BIK-UKB.21 Introduction to Cybersecurity Z,ZK The goal of the course is to provide students with the introduction of basic concepts in modern approach to cybersecurity. Students will get a basic overview of threats in cyberspace and attacker techniques, security mechanisms in networks, operating systems and applications, as well as of basic cyberspace regulations BIK-UOS.21 Unix-like Operating Systems 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. **BIK-VES** Embedded Systems Z,ZK 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. BIK-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. BIK-ZUM.21 Artificial Intelligence Fundamentals 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.

BIK-ZWU Introduction to Web and User Interfaces Z,ZK This course is presented in Czech. TV1 Physical Education 0 TV2K1 Physical Education 2 Ζ 1 TVV Physical education Z 0 TVV0 Physical education Ζ 0

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-10-22, time 03:14.