Recomended pass through the study plan

Name of the pass: Bachelor Branch Security and Information Technology, in Czech, Version 2020

Faculty/Institute/Others:
Department:
Pass through the study plan: Bachelor branch Security and Information Technology, part-time, in Czech, 2020
Branch of study guranteed by the department: Welcome page
Guarantor of the study branch:
Program of study: Informatics, valid until 2024
Type of study: Bachelor combined
Note on the pass: Studenti, kteří opakují studium a mají uznaný předmět ADS, mohou požádat proděkana o uznání zápočtu z SSB.# Předmět EMP je ekvivalentní staršímu předmětu EPD. Platí obousměrná zastupitelnost. Oba předměty lze zapsat dohromady nejvýše dvakrát.#

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-CAO	**Digital and Analog Circuits** ***Martin Daňhel***	Z,ZK	5	13KP+4KC	Z	PP
BIK-MLO	**Mathematical Logic** ***Karel Klouda***	Z,ZK	5	13KP+4KC	Z	PP
BIK-PA1	**Programming and Algorithmics 1** ***Josef Vogel***	Z,ZK	6	20KP+6KC	Z	PP
BIK-PS1	**Programming in Shell 1** ***Dana Čermáková***	KZ	5	13KP+4KC	Z	PP
BIK-ZMA	**Elements of Calculus** ***Ivo Petr***	Z,ZK	6	20KP+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	**Database Systems** ***Michal Valenta***	Z,ZK	6	13KP+8KC	L	PP
BIK-LIN	**Linear Algebra** ***Karel Klouda***	Z,ZK	7	26KP+4KC	L	PP
BIK-PA2	**Programming and Algorithmics 2**	Z,ZK	7	13KP+4KC	L	PP
BIK-SAP	**Computer Structure and Architecture** ***Martin Daňhel***	Z,ZK	6	13KP+4KC	L	PP
BIK-V.2017	**Čistě volitelné předměty bakalářského programu BIK, verze 2017** *BIK-STO,BIK-EJA,..... (see the list of groups below)*	Min. cours. 0	Min/Max 0/16			V

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	**Algorithms and Graphs 1** ***Jiří Chludil***	Z,ZK	6	14KP+4KC	Z	PP
BIK-AAG	**Automata and Grammars** ***Ondřej Guth***	Z,ZK	6	13KP+4KC	Z	PP

BIK-ZDM	**Elements of Discrete Mathematics**	Z,ZK	5	13KP+4KC	Z	PP
BIK-ADW.1	**Windows Administration** *Miroslav Prágl* ***Miroslav Prágl*** *Miroslav Prágl (Gar.)*	Z,ZK	4	14KP+2KC	Z	PO
BIK-APS.1	**Architectures of Computer Systems** ***Pavel Tvrdík***	Z,ZK	5	14KP+4KC	Z	PO
BIK-V.2017	**Čistě volitelné předměty bakalářského programu BIK, verze 2017** *BIK-STO,BIK-EJA,..... (see the list of groups below)*	Min. cours. 0	Min/Max 0/16			V

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-BEZ	**Security** ***Jiří Dostál***	Z,ZK	6	13KP+4KC	L	PP
BIK-OSY	**Operating Systems** ***Michal Šoch***	Z,ZK	5	13KP+4KC	L	PP
BIK-PSI	**Computer Networks**	Z,ZK	5	13KP+4KC	L	PP
BIK-ADU.1	**Unix Administration**	Z,ZK	5	14KP+4KC	L	PO
BIK-BEK	**Secure Code** ***Róbert Lórencz***	Z,ZK	5	14KP+4KC	L	PO
BIK-V.2017	**Čistě volitelné předměty bakalářského programu BIK, verze 2017** *BIK-STO,BIK-EJA,..... (see the list of groups below)*	Min. cours. 0	Min/Max 0/16			V

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	**Bachelor project** *Zdeněk Muzikář* ***Zdeněk Muzikář*** *Zdeněk Muzikář (Gar.)*	Z	2		Z,L	PP
BIK-PST	**Probability and Statistics** ***Daniel Vašata***	Z,ZK	5	13KP+4KC	Z	PP
BIK-SI1.2	**Software Engineering I** ***Jiří Mlejnek***	Z,ZK	5	13KP+4KC	Z,L	PP
BIK-HWB	**Hardware Security** ***Jiří Buček***	Z,ZK	5	14KP+4KC	Z	PO
BIK-SSB	**System and Network Security** *Jiří Dostál* ***Jiří Dostál*** *Jiří Dostál (Gar.)*	Z,ZK	5	14KP+4KC	Z	PO
BIK-V.2017	**Čistě volitelné předměty bakalářského programu BIK, verze 2017** *BIK-STO,BIK-EJA,..... (see the list of groups below)*	Min. cours. 0	Min/Max 0/16			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	**Bachelor Thesis** ***Zdeněk Muzikář*** *Zdeněk Muzikář (Gar.)*	Z	14		L,Z	PP
BIK-DPR	**Documentation, presentation, and rhetoric** ***Dana Vynikarová***	KZ	4	5ZP	L	PP
BIK-PV-EM.2015	**Povinně volitelné předměty ekonomické bc. programu Informatika, komb. forma studia, verze 2015** *BIK-MEK,BIK-PRP,..... (see the list of groups below)*	Min. cours. 1 Max. cours. 1	Min/Max 4/5			VE
BI-ZKA	**Zkouška z angličtiny 2009** *BI-ANG1,BIE-EEC,..... (see the list of groups below)*	Min. cours. 1 Max. cours. 1	Min/Max 2/4			PJ
BIK-PV-HU.2015	**Povinně volitelné humanitní předměty bakalářského programu Informatika, kombinovaná forma, ver. 2015** *FI-FIL,BIK-HMI,..... (see the list of groups below)*	Min. cours. 1 Max. cours.	Min/Max 2/20			VH

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BIK-V.2017	**Čistě volitelné předměty bakalářského programu BIK, verze 2017** *BIK-STO,BIK-EJA,..... (see the list of groups below)*	Min. cours. 0	Min/Max 0/16			V

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

Kód	Name of the group of courses and codes of members of this group (for specification see here or below the list of courses)	Completion	Credits	Scope	Semester	Role
BI-ZKA	**Zkouška z angličtiny 2009**	**Min. cours. 1** **Max. cours. 1**	**Min/Max** 2/4			**PJ**
BI-ANG1	English Language Examination wit ...	BIE-EEC	English language external certif ...	BI-ANG	English Language, Internal Certi ...	
BIK-PV-EM.2015	**Povinně volitelné předměty ekonomické bc. programu Informatika, komb. forma studia, verze 2015**	**Min. cours. 1** **Max. cours. 1**	**Min/Max** 4/5			**VE**
BIK-MEK	Macroeconomic Context of Domesti ...	BIK-PRP	Law and Business	BIK-PRR.21	Project management	
BIK-PV-HU.2015	**Povinně volitelné humanitní předměty bakalářského programu Informatika, kombinovaná forma, ver. 2015**	**Min. cours. 1** **Max. cours. 9**	**Min/Max** 2/20			**VH**
FI-FIL	Philosophy	BIK-HMI	History of Mathematics and Infor ...	FI-HTE	History of Technology and Econom ...	
FI-HPZ	Humanities subject from a study ...	FI-MPL	Managerial Psychology	FI-KSA	Cultural and Social Anthropology	
BIK-KSA	Cultural and Social Anthropology	FI-ULI	Introduction to Linguistics for ...			
BIK-V.2017	**Čistě volitelné předměty bakalářského programu BIK, verze 2017**	**Min. cours. 0**	**Min/Max** 0/16			**V**
BIK-STO	Storage and Filesystems	BIK-EJA	Enterprise Java	BIK-HMI	History of Mathematics and Infor ...	
BIK-SQL.1	Language SQL	BIK-OOP	Object-Oriented Programming	BIK-PJV	Programming in Java	
BIK-PRR.21	Project management	BIK-PKM	Introduction to Mathematics	TVV	Physical education	
TV1	Physical Education	TVV0	Physical education	BIK-ZWU	Introduction to Web and User Int ...	

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-ANG		
BI-ANG1	English Language Examination without Preparatory Courses	Z,ZK	2
BI-BAP	Bachelor Thesis	Z	14
BIE-EEC	English language external certificate	Z	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.		
BIK-AAG	Automata and Grammars	Z,ZK	6
	Students are introduced to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite automata, regular expressions, and regular grammars, translation finite automata, construction and use of pushdown automata, hierarchy of formal languages. Knowledge acquired through the module is applicable to creation of algorithms for pattern matching, data compression, translation, simple parsing, and creation of digital circuits.		
BIK-ADU.1	Unix Administration	Z,ZK	5
	Students became familiar with the internal structure of Unix-like systems, with the administration of their basic subsystems and with the principles of their protection against unauthorized use. In the seminars they will verify the information from the lectures on real life examples from practice. They will understand the differences between user and administrator roles. They gain theoretical and practical knowledge of tools for tracking, analyzing, debugging and securing systems, implementing and managing file systems, disk subsystems, processes, memory, network services, shared file systems, name services, remote access, and system boot.		
BIK-ADW.1	Windows Administration	Z,ZK	4
	This course is presented in Czech.		
BIK-AG1	Algorithms and Graphs 1	Z,ZK	6
	This course is presented in Czech.		

BIK-APS.1	Architectures of Computer Systems This course is presented in Czech.	Z,ZK	5
BIK-BEK	Secure Code	Z,ZK	5
The students will learn how to assess security risks and how to take them into account in the design phase of their own code and solutions. After getting familiar with the threat modeling theory, students gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every program needs to run with administrator privileges. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securing data and the relationships of security and database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the defense against them.			
BIK-BEZ	Security	Z,ZK	6
Students understand the mathematical fundamentals of cryptography and have an overview of current cryptographic algorithms and applications: symmetric and asymmetric cryptosystems, and hash functions. They also learn the fundamentals of secure programming and IT security, the fundamentals of designing and using modern cryptosystems for computer systems. They are able to use properly and securely cryptographic primitives and systems that are based on these primitives.			
BIK-BPR	Bachelor project	Z	2
BIK-CAO	Digital and Analog Circuits	Z,ZK	5
Students get the fundamental understanding of technologies underlying electronic digital systems. The understand the basic theoretical models and principles of functionality of transistors, gates, circuits, and conductors. They are able to design simple circuits and evaluate circuit parameters. They understand the differences between analog and digital modes of electronic devices.			
BIK-DBS	Database Systems	Z,ZK	6
Students are introduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn to design small databases (including integrity constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the SQL language, as well as with its theoretical foundation ? the relational database model. They learn the principles of normalizing a relational database schema. They understand the fundamental concepts of transaction processing, controlling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced to special ways of storing data in relational databases with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of database systems, debugging and optimizing database applications, distributed database systems, data stores.			
BIK-DPR	Documentation, presentation, and rhetoric This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	KZ	4
BIK-EJA	Enterprise Java	KZ	4
The course covers Java technologies (Jakarta EE, Microprofile, etc.) which are used for the development of EIS (Enterprise Information Systems). These applications typically manage persistent data, are accessible to clients via the REST API and are created in the microservice architecture and deployed into orchestrated containers.			
BIK-HMI	History of Mathematics and Informatics This course is presented in Czech.	ZK	3
BIK-HWB	Hardware Security	Z,ZK	5
The course deals with hardware resources used to ensure security of computer systems including embedded ones. The students become familiar with the operating principles of cryptographic modules, the security features of modern processors, and storage media protection through encryption. They will gain knowledge about vulnerabilities of HW resources, including side-channel attacks and tampering with hardware during manufacture. Students will have an overview of contact and contactless smart card technology including applications and related topics for multi-factor authentication (biometrics). Students will understand the problems of effective implementation of ciphers.			
BIK-KSA	Cultural and Social Anthropology	ZK	2
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-LIN	Linear Algebra	Z,ZK	7
Students understand the theoretical foundation of algebra and mathematical principles of linear models of systems around us, where the dependencies among components are only linear. They know the basic methods for operating with matrices and linear spaces. They are able to perform matrix operations and solve systems of linear equations. They can apply these mathematical principles to solving problems in 2D or 3D analytic geometry. They understand the error-detecting and error-correcting codes.			
BIK-MEK	Macroeconomic Context of Domestic and World Economy This course is presented in Czech.	KZ	4
BIK-MLO	Mathematical Logic	Z,ZK	5
Students have knowledge of the syntax and semantics of the propositional and predicate logic. They master the Boolean algebra, both theoretically as an instance of universal algebra, and practically as a tool to describe the world of digital systems. They get skills to handle Boolean functions, normal forms, maps, and minimisation methods needed in the further modules.			
BIK-OOP	Object-Oriented Programming	Z,ZK	4
This course is presented in Czech. Object-oriented programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course we look at some of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development including testing, error handing, refactoring and design patterns.			
BIK-OSY	Operating Systems	Z,ZK	5
Students understand the classical theory of operating systems (OS) in addition to the knowledge gained in the module "Programming in Shell 1". They get a solid knowledge of OS kernels, processes and threads implementations. They understand the problems of race conditions, thread scheduling, resource allocation and deadlocks, the techniques of the management of virtual memory, principles and architectures of disks, RAID and file systems. They are able to design and implement simple multithreaded applications.			
BIK-PA1	Programming and Algorithmics 1	Z,ZK	6
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.			
BIK-PA2	Programming and Algorithmics 2	Z,ZK	7
Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, set, table). They can implement linked structures. They learn these skills using the programming language C++. Although this is not a module of programming in C++, students are introduced with all C++ features needed to achieve the main objective (operator overloading, templates).			
BIK-PJV	Programming in Java This course is presented in Czech. However, there is an English variant in the full-time program Informatics (B1801 / 4753).	Z,ZK	4
BIK-PKM	Introduction to Mathematics This course is presented in Czech.	Z	4

BIK-PRP	Law and Business	Z,ZK	4
Students understand the basic issues when engaging in business activities in the CR and in the EU. Students learn to establish companies, gain necessary business permits, conclude commercial or civil contracts. Students also get acquainted with the principles of antitrust regulation and learn to resolve disputes in the area of business, labour, or civil relationships in courts.			
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-PS1	Programming in Shell 1	KZ	5
Students become advanced and knowledgeable users of common UNIX-like operating systems. They understand the fundamental principles of the operating systems (file systems, processes and threads, access rights, memory management, network interfaces). They gain the knowledge of advanced users, with hands-on experience of the shell, basic commands, and filters.			
BIK-PSI	Computer Networks	Z,ZK	5
Students understand the basic common techniques, protocols, technologies, and algorithms necessary to communicate in computer networks. The topics are primarily focused on the 2nd to 4th layer of the ISO OSI model. They also get a basic understanding of communication media, security, and network administration. Students will be able to write a simple network application and configure a simple network.			
BIK-PST	Probability and Statistics	Z,ZK	5
Students are introduced to elements of probability thinking, ability of the synthesis both prior and posterior information and use to work with random variables. They will be able to apply correctly basic models of the distribution of random variables and to solve applied probability problems in the area of informatics and computer science. Using statistical inference methods, they master methods of statistical inference to estimate unknown population parameters on the basis of sample. They get acquainted with basic methods of the determination of possible statistical dependence of two or more random variables.			
BIK-SAP	Computer Structure and Architecture	Z,ZK	6
Students understand basic digital computer units and their structures, functions, and hardware implementation: ALU, control unit, memory system, inputs, outputs, data storage and transfer. In the labs, students gain practical experience with the design and implementation of the logic of a simple processor using modern digital design tools. The subject teaches basic knowledge of digital computer construction principles, how a computer performs its operations, what is machine code, and what are its connections to higher programming languages.			
BIK-SI1.2	Software Engineering I	Z,ZK	5
Students learn the methods of analysis and design of large software systems, which are typically designed and implemented in teams. They get practical skill thanks to applying hands-on analysis and design of a large-scale software project that is to be developed within the concurrent BI-SP1 module. They get skill to use CASE tools and UML for modelling and solving software-related problems. They get overview of object-oriented analysis, design, architecture, validation, verification, and testing processes.			
BIK-SQL.1	Language SQL	KZ	4
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-SSB	System and Network Security	Z,ZK	5
This course is focused on selected areas of computer networks and computer systems in terms of cyber security			
BIK-STO	Storage and Filesystems	Z,ZK	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.			
BIK-ZDM	Elements of Discrete Mathematics	Z,ZK	5
Students get both a mathematical sound background, but also practical calculation skills in the area of combinatorics, value estimation and formula approximation, tools for solving recurrent equations, and basics of graph theory.			
BIK-ZMA	Elements of Calculus	Z,ZK	6
Students acquire knowledge and understanding of the fundamentals of classical calculus so that they are able to apply mathematical way of thinking and reasoning and are able to use basic proof techniques. They get skills to practically handle functions of one variable in solving the problems in informatics. They understand the links between the integrals and sums of sequences. They are able to estimate lower or upper bounds of values of real functions and to handle simple asymptotic expressions.			
BIK-ZWU	Introduction to Web and User Interfaces	Z,ZK	4
This course is presented in Czech.			
FI-FIL	Philosophy	ZK	2
see A0B16			
FI-HPZ	Humanities subject from a study abroad	Z	3
A "Humanities subject that has been studied abroad" is covered by the Humanities subject from a study abroad in Compulsory Humanities Module that is required in the curriculum. The substitution is approved by the Vice-Dean for study affairs on behalf of the Dean at the request of the student.			
FI-HTE	History of Technology and Economics	ZK	2
The course introduces the scientific disciplines of history and technology , economic and social history of the Czech lands and Czechoslovakia in comparison with the development of the European region 19 to 21 century .			
FI-KSA	Cultural and Social Anthropology	ZK	2
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 "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc ...) will be shown. The course is an interesting alternative to other humanities, taught at FIT.			
FI-MPL	Managerial Psychology	ZK	2
FI-ULI	Introduction to Linguistics for Computer	ZK	2
This course is presented in Czech.			
TV1	Physical Education	Z	0
TVV	Physical education	Z	0
TVV0	Physical education	Z	0

For updated information see http://bilakniha.cvut.cz/en/FF.html
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