Study plan

Name of study plan: Bachelor branch Security and Information Technology, in Czech, part-time, 2015 - 2019

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Informatics 2009
Type of study: Bachelor combined
Required credits: 156
Elective courses credits: 24
Sum of credits in the plan: 180
Note on the plan: Tato verze studijního plánu je určena pro studenty, které byli přijati ke studiu v akademických rocích 2015/2016 až 2019/2020 do kombinované formy studia bakalářského programu BI.

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 116
The role of the block: PP

Code of the group: BIK-PP.2015
Name of the group: Compulsory Courses of Bachelor Study Program Informatics, in Czech, Version 2015
Requirement credits in the group: In this group you have to gain 116 credits
Requirement courses in the group: In this group you have to complete at least 20 courses
Credits in the group: 116
Note on the group: přechodně jsou ve skupině vzálemně se vylučující předměty BIK-BPR a BI-BPR. Později zde zůstane pouze BI-BPR. Mezi oběma předměty je nastavena ekvivalence.

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, Dušan Knop* ***Jiří Chludil*** *Dušan Knop (Gar.)*	Z,ZK	6	14KP+4KC	Z	PP
BIK-AAG	**Automata and Grammars** *Ondřej Guth, Eliška Šestáková* ***Ondřej Guth***	Z,ZK	6	13KP+4KC	Z	PP
BI-BAP	**Bachelor Thesis** ***Zdeněk Muzikář***	Z	14		L,Z	PP
BIK-BPR	**Bachelor project** *Zdeněk Muzikář* ***Zdeněk Muzikář*** *Zdeněk Muzikář (Gar.)*	Z	2		Z,L	PP
BIK-BEZ	**Security** *Jiří Buček, Jiří Dostál, Róbert Lórencz* ***Jiří Dostál*** *Róbert Lórencz (Gar.)*	Z,ZK	6	13KP+4KC	L	PP
BIK-CAO	**Digital and Analog Circuits** ***Martin Daňhel***	Z,ZK	5	13KP+4KC	Z	PP
BIK-DBS	**Database Systems** ***Michal Valenta***	Z,ZK	6	13KP+8KC	L	PP
BIK-DPR	**Documentation, presentation, and rhetoric** *Ondřej Guth, Dana Vynikarová* ***Dana Vynikarová*** *Dana Vynikarová (Gar.)*	KZ	4	5ZP	L	PP
BIK-LIN	**Linear Algebra** *Karel Klouda* ***Karel Klouda*** *Karel Klouda (Gar.)*	Z,ZK	7	26KP+4KC	L	PP
BIK-MLO	**Mathematical Logic** *Karel Klouda* ***Karel Klouda*** *Karel Klouda (Gar.)*	Z,ZK	5	13KP+4KC	Z	PP
BIK-OSY	**Operating Systems** *Michal Šoch, Jan Trdlička* ***Michal Šoch*** *Michal Šoch (Gar.)*	Z,ZK	5	13KP+4KC	L	PP
BIK-PSI	**Computer Networks** ***Jan Fesl***	Z,ZK	5	13KP+4KC	L	PP
BIK-PST	**Probability and Statistics** ***Daniel Vašata***	Z,ZK	5	13KP+4KC	Z	PP
BIK-PA1	**Programming and Algorithmics 1** ***Josef Vogel***	Z,ZK	6	20KP+6KC	Z	PP
BIK-PA2	**Programming and Algorithmics 2** ***Ladislav Vagner***	Z,ZK	7	13KP+4KC	L	PP

BIK-PS1	**Programming in Shell 1** ***Dana Čermáková***	KZ	5	13KP+4KC	Z	PP
BIK-SI1.2	**Software Engineering I** *Jiří Mlejnek* ***Jiří Mlejnek*** *Jiří Mlejnek (Gar.)*	Z,ZK	5	13KP+4KC	Z,L	PP
BIK-SAP	**Computer Structure and Architecture** ***Martin Daňhel***	Z,ZK	6	13KP+4KC	L	PP
BIK-ZDM	**Elements of Discrete Mathematics** *Eva Pernecká* ***Josef Kolář*** *Josef Kolář (Gar.)*	Z,ZK	5	13KP+4KC	Z	PP
BIK-ZMA	**Elements of Calculus** *Ivo Petr* ***Ivo Petr*** *Tomáš Kalvoda (Gar.)*	Z,ZK	6	20KP+4KC	Z	PP

Characteristics of the courses of this group of Study Plan: Code=BIK-PP.2015 Name=Compulsory Courses of Bachelor Study Program Informatics, in Czech, Version 2015

BIK-AG1	Algorithms and Graphs 1	Z,ZK	6
This course is presented in Czech.			
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.			
BI-BAP	Bachelor Thesis	Z	14
BIK-BPR	Bachelor project	Z	2
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-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	KZ	4
This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).			
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-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-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-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-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-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-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-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-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.			

Name of the block: Compulsory courses of the specialization
Minimal number of credits of the block: 32
The role of the block: PO

Code of the group: BIK-PO-BIT.2015
Name of the group: Compulsory Courses of Bc. Branch Security and IT, Part-Time Form, in English, Version 2015
Requirement credits in the group: In this group you have to gain 32 credits
Requirement courses in the group: In this group you have to complete at least 7 courses
Credits in the group: 32
Note on the group:

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-ADU.1	**Unix Administration** *Petr Zemánek* ***Petr Zemánek*** *Zdeněk Muzikář (Gar.)*	Z,ZK	5	14KP+4KC	L	PO
BIK-ADW.1	**Windows Administration** *Jiří Kašpar, Miroslav Prágl* ***Miroslav Prágl*** *Miroslav Prágl (Gar.)*	Z,ZK	4	14KP+2KC	Z	PO
BIK-APS.1	**Architectures of Computer Systems** *Michal Štepanovský, Pavel Tvrdík* ***Pavel Tvrdík*** *Pavel Tvrdík (Gar.)*	Z,ZK	5	14KP+4KC	Z	PO
BIK-BEK	**Secure Code** *Josef Kokeš* ***Róbert Lórencz*** *Róbert Lórencz (Gar.)*	Z,ZK	5	14KP+4KC	L	PO
BIK-HWB	**Hardware Security** *Jiří Buček, Róbert Lórencz* ***Jiří Buček*** *Róbert Lórencz (Gar.)*	Z,ZK	5	14KP+4KC	Z	PO
BIK-PAI	**Law and Informatics** ***Zdeněk Kučera***	ZK	3	13KP	Z	PO
BIK-SSB	**System and Network Security** *Jiří Dostál* ***Jiří Dostál*** *Jiří Dostál (Gar.)*	Z,ZK	5	14KP+4KC	Z	PO

Characteristics of the courses of this group of Study Plan: Code=BIK-PO-BIT.2015 Name=Compulsory Courses of Bc. Branch Security and IT, Part-Time Form, in English, Version 2015

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-APS.1	Architectures of Computer Systems	Z,ZK	5
This course is presented in Czech.			
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-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-PAI	Law and Informatics	ZK	3

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			

Name of the block: Compulsory elective economic-management courses
Minimal number of credits of the block: 4
The role of the block: VE

Code of the group: BIK-PV-EM.2015
Name of the group: Compulsory Elective Economics Bachelor Courses, Part-time Form of Study, in Czech, Ver. 2015
Requirement credits in the group: In this group you have to gain at least 4 credits (at most 5)
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 4
Note on the group:

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-MEK	**Macroeconomic Context of Domestic and World Economy** *Ivo Straka* ***Ivo Straka*** *Ivo Straka (Gar.)*	KZ	4	13KP+2KC	L	VE
BIK-PRP	**Law and Business** ***Zdeněk Kučera***	Z,ZK	4	13KP+4KC	L	VE
BIK-PRR.21	**Project management** *David Pešek* ***David Pešek*** *Petra Pavlíčková (Gar.)*	Z,ZK	5	14KP+4KC	Z	VE

Characteristics of the courses of this group of Study Plan: Code=BIK-PV-EM.2015 Name=Compulsory Elective Economics Bachelor Courses, Part-time Form of Study, in Czech, Ver. 2015

BIK-MEK	Macroeconomic Context of Domestic and World Economy	KZ	4
This course is presented in Czech.			
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.			

Name of the block: Povinná zkouška z angličtiny
Minimal number of credits of the block: 2
The role of the block: PJ

Code of the group: BI-ZKA
Name of the group: English Language, Internal Certifica
Requirement credits in the group: In this group you have to gain at least 2 credits (at most 4)
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 2
Note on the group: Ze skupiny je nutné absolvovat jeden ze dvou předmětů, představujících interní zkoušku z angličtiny. -- Předmět BI-ANG si zapisují studenti, kteří absolvovali přípravné kurzy z angličtiny a mají zápočet z předmětu BI-A2L. -- Předmět BI--ANG1 si zapisují studenti, kteří se na zkoušku připravovali samostatně. Tito studenti musí před vlastní zkouškou absolvovat zápočtovou písemku.

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
BIE-EEC	**English external certificate** *Zdeněk Muzikář* ***Zdeněk Muzikář*** *Zdeněk Muzikář (Gar.)*	Z	4		L	PJ
BI-ANG1	**English Language Examination without Preparatory Courses** *Kateřina Valentová* ***Kateřina Valentová*** *Kateřina Valentová (Gar.)*	Z,ZK	2		L	PJ
BI-ANG	**English Language, Internal Certificate** *Kateřina Valentová* ***Kateřina Valentová*** *Kateřina Valentová (Gar.)*	ZK	2		Z,L	PJ

Characteristics of the courses of this group of Study Plan: Code=BI-ZKA Name=English Language, Internal Certifica

BIE-EEC	English 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.			

BI-ANG1	English Language Examination without Preparatory Courses	Z,ZK	2
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			

Name of the block: Compulsory elective humanities courses
Minimal number of credits of the block: 2
The role of the block: VH

Code of the group: BIK-PV-HU.2015
Name of the group: Compulsory Elective Humanity Courses of Bc. Program Informatics, Part-time Form, in Czech, Ver. 2015
Requirement credits in the group: In this group you have to gain at least 2 credits (at most 20)
Requirement courses in the group: In this group you have to complete at least 1 course (at most 9)
Credits in the group: 2
Note on the group:

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
FI-FIL	**Philosophy** *Peter Zamarovský* ***Peter Zamarovský*** *Peter Zamarovský (Gar.)*	ZK	2	2P	Z,L	VH
BIK-HMI	**History of Mathematics and Informatics** *Alena Šolcová* ***Alena Šolcová*** *Alena Šolcová (Gar.)*	ZK	3	13KP+2KC	L	VH
FI-HTE	**History of Technology and Economics** *Jan Mikeš, Marcela Efmertová* ***Jan Mikeš*** *Jan Mikeš (Gar.)*	ZK	2	2+0	Z,L	VH
FI-HPZ	**Humanities subject from a study abroad** ***Miroslav Balík***	Z	3	0+0	Z,L	VH
FI-MPL	**Managerial Psychology**	ZK	2	2+0	Z,L	VH
FI-KSA	**Cultural and Social Anthropology** ***Jakub Šenovský***	ZK	2	2P	L,Z	VH
BIK-KSA	**Cultural and Social Anthropology** *Tomáš Houdek, Alena Libánská, Jakub Šenovský* ***Jakub Šenovský*** *Alena Libánská (Gar.)*	ZK	2	13KP	L	VH
FI-ULI	**Introduction to Linguistics for Computer** ***Václav Cvrček***	ZK	2	2P	L	VH

Characteristics of the courses of this group of Study Plan: Code=BIK-PV-HU.2015 Name=Compulsory Elective Humanity Courses of Bc. Program Informatics, Part-time Form, in Czech, Ver. 2015

FI-FIL	Philosophy	ZK	2
see A0B16			
BIK-HMI	History of Mathematics and Informatics	ZK	3
This course is presented in Czech.			
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-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-MPL	Managerial Psychology	ZK	2
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.			
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.			
FI-ULI	Introduction to Linguistics for Computer	ZK	2
This course is presented in Czech.			

Name of the block: Elective courses
Minimal number of credits of the block: 0
The role of the block: V

Code of the group: BIK-V.2017
Name of the group: Purely Elective Courses of Bachelor Programme BI, Version 2017

Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group:

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-STO	**Storage and Filesystems** ***Jiří Kašpar***	Z,ZK	4	13KP+4KC	L,Z	v
BIK-EJA	**Enterprise Java** ***Jiří Daněček***	KZ	4	13KP+4KC	Z	v
BIK-HMI	**History of Mathematics and Informatics** *Alena Šolcová* ***Alena Šolcová*** *Alena Šolcová (Gar.)*	ZK	3	13KP+2KC	L	v
BIK-SQL.1	**Language SQL** *Michal Valenta* ***Michal Valenta*** *Michal Valenta (Gar.)*	KZ	4	13KP+4KC	L	v
BIK-OOP	**Object-Oriented Programming** *Filip Křikava* ***Filip Křikava*** *Filip Křikava (Gar.)*	Z,ZK	4	14KP+4KC	Z	v
BIK-PJV	**Programming in Java** *Jan Blizničenko* ***Jan Blizničenko*** *Jan Blizničenko (Gar.)*	Z,ZK	4	13KP+4KC	Z	v
BIK-PRR.21	**Project management** *David Pešek* ***David Pešek*** *Petra Pavlíčková (Gar.)*	Z,ZK	5	14KP+4KC	Z	v
BIK-PKM	**Introduction to Mathematics** ***Karel Klouda*** *Tomáš Kalvoda (Gar.)*	Z	4		Z	v
BIK-ZWU	**Introduction to Web and User Interfaces** ***Jiří Pavelka***	Z,ZK	4	13KP+4KC	Z	v

Characteristics of the courses of this group of Study Plan: Code=BIK-V.2017 Name=Purely Elective Courses of Bachelor Programme BI, Version 2017

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-HMI	History of Mathematics and Informatics	ZK	3
This course is presented in Czech.			
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-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-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-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-PJV	Programming in Java	Z,ZK	4
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	Z	4
This course is presented in Czech.			
BIK-ZWU	Introduction to Web and User Interfaces	Z,ZK	4
This course is presented in Czech.			

Code of the group: BIK-BIT-VO.2017
Name of the group: Elective Vocational Courses for a Bachelor Branch BIK-BIT, Version 2017
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group: Všechny povinné předměty oborů a zaměření s výjimkou tohoto oboru

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-ADS	**Network Administration** ***Viktor Černý***	Z,ZK	5	13KP+4KC	Z	v

BIK-AWD	**Web and Database Server Administration** ***Lukáš Bařinka***	Z,ZK	4	13KP+4KC	L	v
BIK-EFA	**Efficient Algorithms** ***Jiří Chludil***	Z,ZK	5	13KP+4KC	Z	v
BIK-EIA	**Efficient Implementation of Algorithms** ***Ivan Šimeček***	Z,ZK	5	13KP+4KC	Z	v
BIK-GRA	**Graph Algorithms** ***Jiří Chludil***	Z,ZK	5	13KP+4KC	L	v
BIK-KOM	**Conceptual Modelling** *Michal Valenta, Marek Suchánek, Robert Pergl, Mohamed Bettaz* ***Robert Pergl*** *Robert Pergl (Gar.)*	Z,ZK	5	14KP+4KC	Z	v
BIK-MGA	**Multimedia and Graphics Applications** *Lukáš Bařinka* ***Lukáš Bařinka*** *Lukáš Bařinka (Gar.)*	Z,ZK	5	13KP+4KC	Z	v
BIK-OMO	**Object Modeling** ***Robert Pergl***	Z,ZK	5	13KP+4KC	Z	v
BIK-OOP	**Object-Oriented Programming** *Filip Křikava* ***Filip Křikava*** *Filip Křikava (Gar.)*	Z,ZK	4	14KP+4KC	Z	v
BIK-PRP	**Law and Business** ***Zdeněk Kučera***	Z,ZK	4	13KP+4KC	L	v
BIK-PPA	**Programming Paradigms** *Jan Janoušek, Jan Sliacký* ***Jan Janoušek*** *Jan Janoušek (Gar.)*	Z,ZK	5	14KP+4KC	Z	v
BIK-SI2.2	**Software Engineering 2** ***Jiří Mlejnek***	ZK	5	13KP	Z	v
BIK-SI2.3	**Software Engineering 2** *Jiří Mlejnek* ***Jiří Mlejnek*** *Jiří Mlejnek (Gar.)*	Z,ZK	3	14KP	Z	v
BIK-SP1	**Team Software Project 1** *Jiří Mlejnek* ***Jiří Mlejnek*** *Jiří Mlejnek (Gar.)*	KZ	4	8KC	L	v
BIK-SP2	**Team Software Project 2** ***Michal Valenta***	KZ	6	12KC	Z	v
BIK-SP2.1	**Team Software Project 2** ***Jiří Mlejnek*** *Jiří Mlejnek (Gar.)*	KZ	4	12KC	Z	v
BIK-TJV	**Java Technology** *Jiří Daněček* ***Ondřej Guth*** *Ondřej Guth (Gar.)*	Z,ZK	4	14KP+4KC	Z	v
BIK-TIS	**Information Systems Design**	Z,ZK	5	13KP+2KC	Z	v
BIK-TUR	**User Interface Design** ***Jan Schmidt***	Z,ZK	4	13KP+4KC	L	v
BIK-VES	**Embedded Systems** ***Miroslav Skrbek***	Z,ZK	5	13KP+4KC	L	v
BIK-VZD	**Data Mining** ***Pavel Kordík***	Z,ZK	4	13KP+4KC	L	v

Characteristics of the courses of this group of Study Plan: Code=BIK-BIT-VO.2017 Name=Elective Vocational Courses for a Bachelor Branch BIK-BIT, Version 2017

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-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-ADS	Network Administration	Z,ZK	5

Students acquire basic skills needed to administrate computer networks, networking technologies, services, and to ensure their security. They understand and are able practically use Ethernet technology, VLAN, authorisation, security architecture of computer networks, routing protocols and backbone routing mechanisms, directory and naming services and addressing, administration of networking equipment, secure client connections and secure data transfer, flow control mechanisms, and service availability monitoring.

BIK-AWD	Web and Database Server Administration	Z,ZK	4

Student in the branch "BI-IT Information technology" who lack the compulsory BIK-AWD course, ask the office of study affairs for enrolling an equivalent course BIK-AWD.1, which has a block lectures. Students are introduced to the administration of database and web servers and services. Students will be able to install, configure, maintain, test and backup complex systems of database and web services. To provide a balanced overview, students will be introduced to three different database engines: Oracle as a representative of a large commercial system; PostgreSQL as a representative of a complex and advanced open-source, community-developed software; MySQL as the most common database engine to use with the Apache web server.

BIK-EFA	Efficient Algorithms	Z,ZK	5

Students get a solid overview of efficient algorithms for solving classical algorithmic problems: selecting, searching, sorting, and other basic forms of reshaping and processing tree-like data structures. Students are able to design and implement such algorithms, to analyse their complexity, and to develop an optimised efficient algorithm under specific requirements or constraints. They are able to recognise a proper algorithm variant for any specific usage.

BIK-EIA	Efficient Implementation of Algorithms	Z,ZK	5

Student learn to combine their SW skills (efficient algorithms) and HW knowledge (utilization of all available features of the particular processor and memory architecture). Students learn the basics of code tuning.

BIK-GRA	Graph Algorithms	Z,ZK	5

Students get an overview of typical usages of graph models in computing. They learn algorithmic methods of solution of graph problems, using the programming techniques presented in the BI-EFA module. They understand algorithms for the key application domains of graph theory (flows in networks, heuristic search, approximation of complex problems, matching problems). Students get basic competence in computer science background: they understand Turing machine models and issues of NP-completeness and NP-hardness.

BIK-KOM	Conceptual Modelling	Z,ZK	5

BIK-MGA	Multimedia and Graphics Applications	Z,ZK	5
Students gain practical experience with applications for 2D/3D graphics and DTP, as well as with basic methods of creating and editing computer graphics. Students learn theoretical fundamentals of computer graphics. During the semester, students work on various parts of a complex project involving 2D/3D graphics and DTP.			
BIK-OMO	Object Modeling	Z,ZK	5
Students will practically master conceptual modelling of business structures, they will learn fundamentals of OntoUML notation and methodology. Students will learn fundamentals of pure object-oriented paradigm, i.e. terms object, method, message, class, class instance, composition, inheritance, collections. Students will learn to transform a conceptual model to object-oriented implementation model and they will learn fundamentals of pure object-oriented implementation in Smalltalk and pure object database. Students will learn to formulate rules and queries upon the object database.			
BIK-PPA	Programming Paradigms	Z,ZK	5
The course deals with basic paradigms of high-level programming languages, including their basic execution models, benefits, and limitations of particular approaches. Functional programming paradigm and its basic principles are explained in details. Logic programming is introduced as another way of declarative programming. The principles are demonstrated on lambda calculus and on Lisp (Racket) and Prolog programming languages. Moreover, usage of these principles is demonstrated on modern mainstream programming languages such as C++ and Java.			
BIK-SI2.2	Software Engineering 2	ZK	5
BIK-SI2.3	Software Engineering 2	Z,ZK	3
This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).			
BIK-SP1	Team Software Project 1	KZ	4
Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided by the BEI-SI1 course that runs concurrently and that teaches the necessary techniques and theory. Teams consisting of 4-6 students will work on a specific project. The teacher, in the role of the team and project leader, regularly consults with the team (at the seminars) with respect to both the formal and material aspects of the design. The resulting work will be further developed and finished in the BEI-SP2 course.			
BIK-SP2	Team Software Project 2	KZ	6
Students gain hands-on experience with the iterative development process while working on a large-scale software project. The first iteration is the result of the BEI-SP1 course project. However, this time, the functionality, testing and documenting of the system being developed will be emphasized. Students will work in teams of 4-6 people. The teacher, in the role of the team and project leader, regularly consults with the team (at the seminars) with regard to the formal as well as material aspects of their solution. The BEI-SI2 course that runs concurrently will provide the students with supporting knowledge, especially in the area of teamwork, testing and quality assurance of the software product.			
BIK-SP2.1	Team Software Project 2	KZ	4
BIK-TJV	Java Technology	Z,ZK	4
The subject goal is to introduce the programming language Java. The student gains practical experiences for smaller enterprise application programming. This subject presents how to build the three and more layers enterprise systems. The student practically exercises all communication interfaces for each layers (JDBC, RestWeb services, JNDI etc.). At the course end is student able to create three layers enterprise application.			
BIK-TIS	Information Systems Design	Z,ZK	5
Students know various types of ISs and their practical implementation aspects and are able to match the needs of different market segments (customers) with applications of existing technologies (databases, programming languages, GUI etc.).			
BIK-TUR	User Interface Design	Z,ZK	4
Students have a basic overview of the methods for designing and testing common user interfaces. They have 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 the methods that bring users into the development process to ensure optimal communication with a user.			
BIK-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.			
BIK-VZD	Data Mining	Z,ZK	4
Students are introduced to the basic methods of discovering knowledge in data. In particular, they learn the basic techniques of data preprocessing, multidimensional data visualization, statistical techniques of data transformation, and fundamental principles of knowledge discovery methods. Students will be aware of the relationships between model bias and variance, and know the fundamentals of assessing model quality. Data mining software is extensively used in the module. Students will be able to apply basic data mining tools to common problems (classification, regression, clustering).			

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 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-ADS	Network Administration	Z,ZK	5
Students acquire basic skills needed to administrate computer networks, networking technologies, services, and to ensure their security. They understand and are able practically use Ethernet technology, VLAN, authorisation, security architecture of computer networks, routing protocols and backbone routing mechanisms, directory and naming services and addressing, administration of networking equipment, secure client connections and secure data transfer, flow control mechanisms, and service availability monitoring.			

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	Z,ZK	5
This course is presented in Czech.			
BIK-AWD	Web and Database Server Administration	Z,ZK	4
Student in the branch "BI-IT Information technology" who lack the compulsory BIK-AWD course, ask the office of study affairs for enrolling an equivalent course BIK-AWD.1, which has a block lectures. Students are introduced to the administration of database and web servers and services. Students will be able to install, configure, maintain, test and backup complex systems of database and web services. To provide a balanced overview, students will be introduced to three different database engines: Oracle as a representative of a large commercial system; PostgreSQL as a representative of a complex and advanced open-source, community-developed software; MySQL as the most common database engine to use with the Apache web server.			
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	KZ	4
This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).			
BIK-EFA	Efficient Algorithms	Z,ZK	5
Students get a solid overview of efficient algorithms for solving classical algorithmic problems: selecting, searching, sorting, and other basic forms of reshaping and processing tree-like data structures. Students are able to design and implement such algorithms, to analyse their complexity, and to develop an optimised efficient algorithm under specific requirements or constraints. They are able to recognise a proper algorithm variant for any specific usage.			
BIK-EIA	Efficient Implementation of Algorithms	Z,ZK	5
Student learn to combine their SW skills (efficient algorithms) and HW knowledge (utilization of all available features of the particular processor and memory architecture). Students learn the basics of code tuning.			
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-GRA	Graph Algorithms	Z,ZK	5
Students get an overview of typical usages of graph models in computing. They learn algorithmic methods of solution of graph problems, using the programming techniques presented in the BI-EFA module. They understand algorithms for the key application domains of graph theory (flows in networks, heuristic search, approximation of complex problems, matching problems). Students get basic competence in computer science background: they understand Turing machine models and issues of NP-completeness and NP-hardness.			
BIK-HMI	History of Mathematics and Informatics	ZK	3
This course is presented in Czech.			
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-KOM	Conceptual Modelling	Z,ZK	5
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-MGA	Multimedia and Graphics Applications	Z,ZK	5
	Students gain practical experience with applications for 2D/3D graphics and DTP, as well as with basic methods of creating and editing computer graphics. Students learn theoretical fundamentals of computer graphics. During the semester, students work on various parts of a complex project involving 2D/3D graphics and DTP.		
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-OMO	Object Modeling	Z,ZK	5
	Students will practically master conceptual modelling of business structures, they will learn fundamentals of OntoUML notation and methodology. Students will learn fundamentals of pure object-oriented paradigm, i.e. terms object, method, message, class, class instance, composition, inheritance, collections. Students will learn to transform a conceptual model to object-oriented implementation model and they will learn fundamentals of pure object-oriented implementation in Smalltalk and pure object database. Students will learn to formulate rules and queries upon the object database.		
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-PAI	Law and Informatics	ZK	3
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-PPA	Programming Paradigms	Z,ZK	5
	The course deals with basic paradigms of high-level programming languages, including their basic execution models, benefits, and limitations of particular approaches. Functional programming paradigm and its basic principles are explained in details. Logic programming is introduced as another way of declarative programming. The principles are demonstrated on lambda calculus and on Lisp (Racket) and Prolog programming languages. Moreover, usage of these principles is demonstrated on modern mainstream programming languages such as C++ and Java.		
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-SI2.2	Software Engineering 2	ZK	5

BIK-SI2.3	Software Engineering 2 This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	Z,ZK	3
BIK-SP1	Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided by the BEI-SI1 course that runs concurrently and that teaches the necessary techniques and theory. Teams consisting of 4-6 students will work on a specific project. The teacher, in the role of the team and project leader, regularly consults with the team (at the seminars) with respect to both the formal and material aspects of the design. The resulting work will be further developed and finished in the BEI-SP2 course.	KZ	4
BIK-SP2	Team Software Project 2 Students gain hands-on experience with the iterative development process while working on a large-scale software project. The first iteration is the result of the BEI-SP1 course project. However, this time, the functionality, testing and documenting of the system being developed will be emphasized. Students will work in teams of 4-6 people. The teacher, in the role of the team and project leader, regularly consults with the team (at the seminars) with regard to the formal as well as material aspects of their solution. The BEI-SI2 course that runs concurrently will provide the students with supporting knowledge, especially in the area of teamwork, testing and quality assurance of the software product.	KZ	6
BIK-SP2.1	Team Software Project 2	KZ	4
BIK-SQL.1	Language SQL 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.	KZ	4
BIK-SSB	System and Network Security This course is focused on selected areas of computer networks and computer systems in terms of cyber security	Z,ZK	5
BIK-STO	Storage and Filesystems 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	4
BIK-TIS	Information Systems Design Students know various types of ISs and their practical implementation aspects and are able to match the needs of different market segments (customers) with applications of existing technologies (databases, programming languages, GUI etc.).	Z,ZK	5
BIK-TJV	Java Technology The subject goal is to introduce the programming language Java. The student gains practical experiences for smaller enterprise application programming. This subject presents how to build the three and more layers enterprise systems. The student practically exercises all communication interfaces for each layers (JDBC, RestWeb services, JNDI etc.). At the course end is student able to create three layers enterprise application.	Z,ZK	4
BIK-TUR	User Interface Design Students have a basic overview of the methods for designing and testing common user interfaces. They have 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 the methods that bring users into the development process to ensure optimal communication with a user.	Z,ZK	4
BIK-VES	Embedded Systems 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.	Z,ZK	5
BIK-VZD	Data Mining Students are introduced to the basic methods of discovering knowledge in data. In particular, they learn the basic techniques of data preprocessing, multidimensional data visualization, statistical techniques of data transformation, and fundamental principles of knowledge discovery methods. Students will be aware of the relationships between model bias and variance, and know the fundamentals of assessing model quality. Data mining software is extensively used in the module. Students will be able to apply basic data mining tools to common problems (classification, regression, clustering).	Z,ZK	4
BIK-ZDM	Elements of Discrete Mathematics 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.	Z,ZK	5
BIK-ZMA	Elements of Calculus 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.	Z,ZK	6
BIK-ZWU	Introduction to Web and User Interfaces This course is presented in Czech.	Z,ZK	4
FI-FIL	Philosophy see A0B16	ZK	2
FI-HPZ	Humanities subject from a study abroad 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.	Z	3
FI-HTE	History of Technology and Economics 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 .	ZK	2
FI-KSA	Cultural and Social Anthropology 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.	ZK	2
FI-MPL	Managerial Psychology	ZK	2
FI-ULI	Introduction to Linguistics for Computer This course is presented in Czech.	ZK	2

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