Study plan

Name of study plan: Bc. specialization Computer Graphics with omitting BI-SVZ

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Informatika
Type of study: Bachelor full-time
Required credits: 153
Elective courses credits: 27
Sum of credits in the plan: 180
Note on the plan: Garant: Ing. Ji í Chludil, email: jiri.chludil@fit.cvut.cz

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 106 The role of the block: PP

Code of the group: BI-PP.21

Name of the group: Compulsory Courses of Bachelor Study Program Informatics, presented in Czech, version 2021

Requirement credits in the group: In this group you have to gain 106 credits

Requirement courses in the group: In this group you have to complete 20 courses

Credits in the group: 106

Note on the group: If you plan to profile the specialization Information Security, Management Informatics, Computer Networks and Internet, Computer Systems and Virtualization, Software Engineering, or Web Engineering, enroll in the course BI-PSI.21 in your 2nd semester of study. If you plan to profile the specialization Computer Graphics, Computer Engineering, Computer Science, or Artificial Intelligence, enroll in the course BI-PSI.21 in your 4th semester of study. If you plan to profile yourself in the Artificial Intelligence specialization, enroll in the course BI-PST.21 in your 3rd semester of study. Otherwise, enroll in the course BI-PSI.21 in your 5th semester of study. If you plan to profile the specialization Artificial Intelligence or Web Engineering, enroll in the course BI-AAG.21 in your 5th semester of study. Otherwise, enroll in the course BI-PSI.21 in your 3rd semester of study.

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-AG1.21	Algorithms and Graphs 1 Dušan Knop, Michal Opler, Ond ej Suchý, Tomáš Valla, Radek Hušek Dušan Knop Dušan Knop (Gar.)	Z,ZK	5	2P+2C	Z	PP
BI-AAG.21	Automata and Grammars Jan Holub, Jan Janoušek Jan Holub Jan Holub (Gar.)	Z,ZK	5	2P+2C	Z	PP
BI-BAP.21	Bachelor Thesis Zden k Muziká Zden k Muziká Zden k Muziká (Gar.)	Z	14		L,Z	PP
BI-BPR.21	Bachelor project Zden k Muziká Zden k Muziká (Gar.)	Z	1	0P+0C	Z,L	PP
BI-DBS.21	Database Systems Michal Valenta, Jan Blizni enko, Ji í Hunka, Monika Borkovcová, Jan Matoušek, Pavel K íž, Št pán Pechman, Dominik Roudný, Jan Bittner, Ji í Hunka Michal Valenta (Gar.)	Z,ZK	5	2P+2R+1L	. L	PP
BI-DML.21	Discrete Mathematics and Logic Ji ina Scholtzová, Daniel Dombek, Jan Sp vák Daniel Dombek Jan Sp vák (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
BI-KAB.21	Cryptography and Security Ivana Trummová, Tomáš Rabas, Tomáš Zahradnický, Ji í Bu ek, Martin Jure ek, Josef Kokeš, Róbert Lórencz, Julia Plotnikova, David Pokorný, Róbert Lórencz Róbert Lórencz (Gar.)	Z,ZK	5	2P+2C	L	PP
BI-LA1.21	Linear Algebra 1 Lud k Kleprlík, Jakub Krásenský, Karel Klouda Lud k Kleprlík Karel Klouda (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
BI-MA1.21	Mathematical Analysis 1 Pavel Hrabák, Tomáš Kalvoda, Ivo Petr, Petr Olšák, Pavel Paták Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	5	2P+1R+1C	L	PP

BI-MA2.21	Mathematical Analysis 2 Pavel Hrabák, Tomáš Kalvoda, Ivo Petr, Petr Olšák, Pavel Paták Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	6	3P+2C	Z	PP
BI-OSY.21	Operating Systems Petr Zemánek, Ji í Kašpar, Michal Štepanovský, Jan Trdli ka, Pavel Tvrdík, Ladislav Vagner Pavel Tvrdík Michal Štepanovský (Gar.)	Z,ZK	5	2P+1R+1L	L	PP
BI-PSI.21	Computer Networks Viktor erný, Michal Hažlinský, Vladimír Smotlacha, Yelena Trofimova, Jan Fesl, Josef Koumar, Petr Hoda , Josef Zápotocký, Michal Polák, Jan Fesl Jan Fesl (Gar.)	Z,ZK	5	2P+1R+1C	L	PP
BI-PST.21	Probability and Statistics Kamil Dedecius, Pavel Hrabák, Jitka Hrabáková, Petr Novák, Jana Vacková Pavel Hrabák Pavel Hrabák (Gar.)	Z,ZK	5	2P+2C	Z	PP
BI-PA1.21	Programming and Algorithmics 1 Radek Hušek, Jan Trávní ek, Miroslav Balík, Josef Vogel, Ladislav Vagner Jan Trávní ek Jan Trávní ek (Gar.)	Z,ZK	7	2P+2R+2C	Z	PP
BI-PA2.21	Programming and Algorithmics 2 Radek Hušek, Jan Trávní ek, Josef Vogel, Ladislav Vagner Jan Trávní ek Jan Trávní ek (Gar.)	Z,ZK	7	2P+1R+2C	L	PP
BI-SAP.21	Computer Structure and Architecture Hana Kubátová, Jaroslav Borecký, Petr Fišer, Martin Kohlík Hana Kubátová Hana Kubátová (Gar.)	Z,ZK	5	2P+1R+2C	L	PP
BI-TZP.21	Technological Fundamentals of Computers Jan ezní ek, Jaroslav Borecký, Robert Hülle, Martin Kohlík, Vojt ch Miškovský, Martin Novotný, Matúš Olekšák Martin Novotný Martin Novotný (Gar.)	Z,ZK	5	2P+2C	Z	PP
BI-GIT.21	SW Development Technologies Petr Pulc, Robin Ob rka Robin Ob rka Petr Pulc (Gar.)	Z	3	2P	Z	PP
BI-TDP.21	Documentation and Presentation Ond ej Guth, Petra Pavlí ková, Dana Vynikarová, Alena Libánská, Tomáš Nová ek Dana Vynikarová Dana Vynikarová (Gar.)	КZ	3	2P+2C	Z,L	PP
BI-UOS.21	Unix-like Operating Systems Zden k Muziká, Petr Zemánek, Viktor erný, Michal Hažlinský, Jakub Jan i ka, Miroslav Prágl, Michal Šoch, Jan Trdli ka, Yelena Trofimova, Zden k Muziká Zden k Muziká (Gar.)	ΚZ	5	2P+2C	Z	PP

Characteristics of the courses of this group of Study Plan: Code=BI-PP.21 Name=Compulsory Courses of Bachelor Study Program Informatics, presented in Czech, version 2021

BI-AG1.21	Algorithms and Graphs 1	Z,ZK	5
The course covers the b	asics of efficient algorithm design, data structures, and graph theory, belonging to the core knowledge of every computing c	urriculum. It links a	and partially
develops the knowledge	e from the course BI-DML.21, in which students acquire the knowledge and skills in combinatorics necessary for evaluating the	e time and space	complexity of
algorithms. The course	also follows up knowledge from BI-MA1.21, the practical usage of asymptotic mathematics, in particular, the asymptotic notal	tion.	
BI-AAG.21	Automata and Grammars	Z,ZK	5
Students are introduced	to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of fini	te automata, regu	lar expressions,
and regular grammars,	context-free grammars, construction and use of pushdown automata, and translation grammars and transducers. They know	the hierarchy of fo	rmal languages
and they understand the	e relationships between formal languages and automata. They are introduced to the Turing machine and complexity classes F	P and NP.	
BI-BAP.21	Bachelor Thesis	Z	14
BI-BPR.21	Bachelor project	Z	1
1. At the beginning of th	e semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the	e partial tasks tha	t he / she will
perform during the sem	ester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR	at the end of the	semester. 2. The
external supervisor ente	rs the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.	cvut.cz/student/stu	ıdijni/formulare).
The completed and sigr	ed 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	topic of the work	that the student
has reserved is formula	ed more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the a	ssignment so that	the assignment
can be supplemented a	nd approved at the end of the semester.		
BI-DBS.21	Database Systems	Z,ZK	5
Students are introduced	to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lea	rn to design smal	databases
(including integrity cons	traints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with t	he SQL language	, as well as with
its theoretical foundatior	- the relational database model. They learn the principles of normalizing a relational database schema. They understand the fur	ndamental concep	its 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 introduce	ed 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 da	tabase systems,	debugging and
optimizing database ap	plications, distributed database systems, data stores.		
BI-DML.21	Discrete Mathematics and Logic	Z,ZK	5
Students will get acquai	nted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts	from set theory w	ill be explained.
Special attention is paid	to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The co	urse also lays do	wn the basics of
combinatorics and num	per theory, with emphasis on modular arithmetics.		
BI-KAB.21	Cryptography and Security	Z,ZK	5
Students will understan	d the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able t	o use cryptograph	ic keys and
certificates in systems b	based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in a	pplications. Withir	labs, students
will gain practical skills	n using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procedures	s of cryptanalysis.	
BI-LA1.21	Linear Algebra 1	Z,ZK	5
We will introduce stude	nts to the basic concepts of linear algebra, such as vectors, matrices, vector spaces. We will define vector spaces over the fie	ld of real and con	plex numbers
and also over finite field	s. We will present the concepts of basis and dimension and learn to solve systems of linear equations using the Gaussian elir	nination method (GEM) and show
the connection with line	ar manifolds. We define the regularity of matrices and learn to find their inversions using GEM. We will also learn to find eiger	values and eigen	vectors of a
matrix. We will also dem	ionstrate some applications of these concepts in computer science.		

BI-MA1.21 Mathematical Analysis 1	Z,ZK	5
We begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine number	ers. 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 fu	nctions. This theor	etical 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 sim	nple optimization
problems (i.e., the issue of finding extrema of functions). The course is closed with the Landaus asymptotic notation and methods of mathematical desc	cription of complex	ity of algorithms.
BI-MA2.21 Mathematical Analysis 2	Z,ZK	6
The course completes the theme of analysis of real functions of a real variable initiated in BI-MA1 by introducing the Riemann integral. Students will	1 1	ate 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 t	the computation	of elementary
functions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms	s, 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	l Hessian matrix, v	ve 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 in	ntegration of multiv	variate functions.
BI-OSY.21 Operating Systems	Z,ZK	5
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	1 7 1	race conditions,
critical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS r	-	
and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows.	0 ,	Ū
BI-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 lo	1 / 1	-
well. The lectures will be amended by proseminars that introduce students into network programming and demonstrate the abilities of advanced net		
practically verify configurations and management of network devices in the lab within the environment of the operating systems Linux and Cisco IOS	-	. otudenta
	Z,ZK	5
	· · ·	-
Students will learn the basics of probabilistic thinking, the ability to synthesize prior and posterior information and learn to work with random variable	-	
models of random variable distributions and solve applied probabilistic problems in informatics and computer science. Using the statistical induction		-
estimations of unknown distributional parameters from random sample characteristics. They will also be introduced to the methods for testing statist	ical hypotheses ar	na aetermining
the statistical dependence of two or more random variables.		
BI-PA1.21 Programming and Algorithmics 1	Z,ZK	7
Students gain the ability to formulate algorithms for solving basic problems and write them in the C language. They understand data types (simple, s	structured, pointers	s), expressions,
statements, functions, concept of recursion. They learn to analyse simple cases of algorithm complexity. They know fundamental algorithms for sear	ching, sorting, and	d manipulating
with linked lists and trees.		
BI-PA2.21 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, enlargeab	le 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 pro	gramming,
copying/moving of objects, operator overloading, inheritance, polymorphism).		
BI-SAP.21 Computer Structure and Architecture	Z.ZK	5
Students will get acquainted with the basic architecture and units of a digital computer, understand the structure, function, and implementation of ar	1 / 1	-
memory, I/O communication, methods of data transfers between the units. The logic design and the implementation of a program-controlled simple pr	-	
in the labs using programmable circuits (FPGA), a single-chip microcomputer, and modern design (EDA) tools.		, in promotion of
BI-TZP.21 Technological Fundamentals of Computers	Z,ZK	5
Students get acquainted with the fundamentals of digital and analog circuits, as well as basic methods of analyzing them. Students learn how computers		-
level. They are introduced to the function of a transistor. They will understand why processors generate heat, why cooling is necessary, and how to r		
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 s	upply looks like
(in principle). In the labs, students model the behavior of basic electrical circuits in SW Mathematica.		0
BI-GIT.21 SW Development Technologies	Z	3
This course is aimed at one of the rudimental team software development technology - version control. To be more specific, we will introduce studer	its to Git, the inform	mation manager
from hell, as Linus Torvalds nicknamed it, and provide a comprehensive guide into its depths, as well as for day-to-day use.		
BI-TDP.21 Documentation and Presentation	KZ	3
The course is focused on the basics of creating electronic documentation with emphasis on the creation of technical reports of a larger scope, typical	Ily final university t	heses. Students
learn to create text of a technical report in the LaTeX system, process an electronic presentation using the LaTeX Beamer system, and practically p	resent 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	g. Within the
exercises of the course, an active approach to the creation of individual parts of the bachelor's thesis is assumed.		
BI-UOS.21 Unix-like Operating Systems	KZ	5
Unix-like operating systems represent a large family mostly open-source codes that kept bringing during the history of computers efficient innovative	e functions of multi	iuser operating
systems for computers and their networks and clusters. The most popular OS today, Android, has a unix kernel. Students get overview of basic prop	perties of this OS fa	amily, 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 le	vel of advanced us	sers 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.	
Name of the block: Compulsory courses in the specialization		
Minimal number of credits of the block: 40		

The role of the block: PS

Code of the group: BI-PS-PG-BEZ-SVZ

Name of the group: Compulsory Courses of Specialization C	omputer Graphics, with omitting BI-SVZ
Requirement credits in the group: In this group you have to g	ain 40 credits
Requirement courses in the group: In this group you have to	complete 8 courses
Credits in the group: 40	
Note on the group:	BI-PS-PG.21 #

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-LA2.21	Linear Algebra 2 Daniel Dombek, Lud k Kleprlík, Karel Klouda, Marta Nollová, Jakub Šístek Lud k Kleprlík Karel Klouda (Gar.)	Z,ZK	5	2P+2C	L	PS
BI-MVT.21	Modern Visualisation Technologies Ji í Chludil, Petr Pauš Petr Pauš (Gar.)	Z,ZK	5	2P+2C	Z	PS
BI-MGA.21	Multimedia and Graphics Applications Ji í Chludil, Lukáš Ba inka, Jan Buriánek, Šimon Tan v Lukáš Ba inka Ji í Chludil (Gar.)	Z,ZK	5	2P+2C	Z	PS
BI-PGR.21	Computer graphics programming Petr Felkel, Jaroslav Sloup Jaroslav Sloup Petr Felkel (Gar.)	Z,ZK	5	2P+2C	L	PS
BI-PGA.21	Programming of Graphic Applications Ji í Chludil, Radek Richtr Radek Richtr Radek Richtr (Gar.)	Z,ZK	5	2P+2C	Z	PS
BI-PYT.21	Python Programming Martin Šlapák, Ji í Hanuš, Ond ej Bouchala, Mohamed Bettaz, Jan Šafa ík Martin Šlapák Martin Šlapák (Gar.)	KZ	5	3C	Z,L	PS
BI-SWI.21	Software Engineering Michal Valenta, Ji í Mlejnek, Zden k Rybola Zden k Rybola Michal Valenta (Gar.)	Z,ZK	5	2P+1C	L	PS
BI-TUR.21	User Interface Design Jan Schmidt Jan Schmidt (Gar.)	Z,ZK	5	2P+2C	L	PS

Characteristics of the courses of this group of Study Plan: Code=BI-PS-PG-BEZ-SVZ Name=Compulsory Courses of Specialization Computer Graphics, with omitting BI-SVZ

BI-LA2.21 Linear Algebra 2	Z,ZK	5
Studenti si v tomto p edm tu rozší í znalosti z p edm tu BI-LA1, kde se pracovalo pouze s vektory ve form n-tic ísel. Zde si zavedeme vektorový p	prostor v abstraktr	í obecné form .
Seznámíme se také s pojmem skalární sou in a lineární zobrazení, což nám dovolí ukázat souvislost s lineární algebrou, geometrií a po íta ovou g	rafikou. Dalším ve	lkým tématem
bude numerická lineární algebra, kde si ukážeme potíže s ešením soustav lineárních rovnic na po íta i a možnosti, jak se s tímto problémem vypo a	ádat s d razem na	rozklady matic.
Ukážeme si také aplikace lineární algebry v r zných oborech.		
BI-MVT.21 Modern Visualisation Technologies	Z,ZK	5
The goal of the course is to give an overview of modern visualization technologies and their principles, namely technologies related to virtual and au	gmented reality, v	isualization on
high resolution displays (e.g., SAGE and video mapping) and their applications in practice. Several lectures deal with the content creation for the ment	ioned technologie	s, namely fractal
and procedural visualization, scientific data visualization, and 3D model scanning.		
BI-MGA.21 Multimedia and Graphics Applications	Z,ZK	5
Students get acquainted with multimedia technologies and applications for 2D/3D bitmap and vector graphics. During the course, current tools for we	orking with images	s, videos, 3D
graphics and animation will be introduced. Students learn several basic techniques of creation and editing content in computer graphics, introduction to	graphic formats, a	nd compression
technologies. They learn to use multimedia transmission and representation systems, including real-time multimedia processing. They understand th	e principle of ope	ration and use
of graphics processing cards. They gain a number of practical skills, such as vectorizing raster images, retouching photos, or creating 3D models.		
BI-PGR.21 Computer graphics programming	Z,ZK	5
After attending this curse, students can program a simple interactive 3D graphical application like a computer game or scientific visualization, design	the scene, add te	extures imitating
geometric details and materials (like wall surface, wood, sky), and set up the lighting. At the same time, they understand the fundamental principles and	I terms used in cor	nputer graphics,
such as graphical pipeline, geometric transformations, or lighting model. They gain knowledge allowing orientation in computer graphics and represe	enting solid fundar	nentals for your
professional development, e.g., GPU programming and animations. They get used to techniques utilized in geometric modeling, modeling curves and su	irfaces, and scient	ific visualization.
BI-PGA.21 Programming of Graphic Applications	Z,ZK	5
The course will present the possibilities of current professional open-source tools for image editing, video editing, 3D animation (GIMP, Blender) and the	heir use for visuali	ation of specific
data (3D scenes, mathematical data). Emphasis will be placed on the possibilities of further enhancement of the presented software tools, both usin	g built-in scripting	languages and
by implementation of plugins.		
BI-PYT.21 Python Programming	KZ	5
The aim of the course is to get acquainted with basic efficient control and data structures of the Python programming language for text and binary data	ata processing. Th	e differences
between philosophy of programming in Python and in other programming languages will be explained. Each topic is prepared for students in the form	nat of a Jupyter no	tebook, which
enables greater accent to individual student work. Before each lab, students pass a short test on the last week topic. Four homeworks plus a semest	ter work will be as	signed during
the semester.		
BI-SWI.21 Software Engineering	Z,ZK	5
Students get acquainted with methods of analysis and design of larger software projects that are typically designed and implemented in teams. They	consolidate and	practically verify
their knowledge during the analysis and design of larger software systems that will be developed in the concurrent course BIE-SP1. Students get han	ds-on experience	with CASE tools
using the visual language UML for modeling and solving software problems. Students learn the basics of object-oriented analysis, architecture desig	n and testing. Wit	nin the course,
students also gain a theoretical basis in the field of project management, estimation of costs of software projects, and methods of their development		
BI-TUR.21 User Interface Design	Z,ZK	5
Students gain a basic overview of methods for designing and testing common user interfaces. They get experience to solve the problems where soft	ware and other pr	oducts 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.		
Name of the block: Compulsory elective courses		
Maine of the block. Compusory clockwe courses		

Minimal number of credits of the block: 5 The role of the block: PV

Code of the group: BI-PV-PG.21

Name of the group: Compulsory elective courses for the specialization Computer Graphics, version 2021 Requirement credits in the group: In this group you have to gain at least 5 credits (at most 10)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 2) Credits in the group: 5 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
BI-SP2.21	Team Software Project 2 Stanislav Kuznetsov, Michal Valenta, Ji í Chludil, Ji í Mlejnek, Ji í Hunka, Zden k Rybola, Ji í Borský, Jan Matoušek, Radek Richtr, Ji í Mlejnek Ji í Mlejnek (Gar.)	κz	5	2C	Z	PV
BI-VHS.21	Virtual game worlds Radek Richtr Radek Richtr Radek Richtr (Gar.)	Z,ZK	5	2P+2C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=BI-PV-PG.21 Name=Compulsory elective courses for the specialization Computer Graphics, version 2021

BI-SP2.21	Team Software Project 2				KZ	5
-	experience with the iterative development process while working on a large-scale software					
	, the functionality, testing, and documentation of the software system being developed w team and project leader, regularly consults with the team (at the seminars) the formal as	•				eople. The
	Virtual game worlds	s well as material a	ispecis of in		Z.ZK	5
= · · · · • • - · ·	In methods to create a complex virtual world. It is a follow-up course of basic courses of t	ne PG specializatio	on (BIE-MGA	1	, ,	-
	ign, of principles of writing dialogues and characters in order to create a functional virtual					U U
work on the semester pro	ject.					
Name of the blo	ode: Dovinná telopná výchova, anartovní kurzy					
	ock: Povinná t lesná výchova, sportovní kurzy r of credits of the block: 0					
The role of the	DIOCK: PI					
Codo of the are						
Code of the gro	•					
•	oup: Physical Education, version 2024					
Requirement cr	edits in the group:					
Requirement co	ourses in the group: In this group you have to compl	ete at least	t 2 cour	ses (a	at most	7)
Credits in the g	roup: 0					
Note on the gro	The student is obliged to succe	ssfully compl	ete two d	courses	of this gr	oup.
	Name of the course / Name of the group of courses				1	
Code	(in case of groups of courses the list of codes of their	Completion	Credits	Scope	Semeste	r Role
	members) Tutors, authors and guarantors (gar.)			•		
TV1	Physical Education	Z	0	0+2	Z	PT
TVV	Physical education	Z	0	0+2	Z,L	PT
TVK1	Physical Education Luboš Neuman Ji (Drnek (Gar.)	Z	1		L,Z	PT
TVV0	Physical education	Z	0	0+2	Z,L	PT
TV2	Physical Education	Z	0	0+2	,_ L	PT
TVKZV	Physical Education Course	Z	0	7dní	Z	PT
TVKLV	Physical Education Course	Z	0	7dní	L	PT
L	1 -				1	1

Characteristics of the courses of this group of Study Plan: Code=BI-PT.24 Name=Physical Education, version 2024

TV1	Physical Education	Z	0
TVV	Physical education	Z	0
TVK1	Physical Education	Z	1
TVV0	Physical education	Z	0
TV2	Physical Education	Z	0
TVKZV	Physical Education Course	Z	0
TVKLV	Physical Education Course	Z	0
		•	

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

Code of the group: BI-ZKA.21 Name of the group: English Language Exam 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: BI-ANG, ending with an exam for two credits, is enrolled by students who have completed preparator English courses and have a credit from the BI-A2L course.

senrolled by students who prepared for the exam independently and do not have credit from BI-A2L. These students must complete a credit paper before their own exam. After passing the exam, the student will also be recognized for the course BI-ANGS (Independent preparation for the English exam) for 2 credits.

--

The BIE-ECC course can be recognized for any active semester after the submission of a external certificate at the level of at least B2 according to the Common European Framework of Reference.

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-ANG1	English Language Examination without Preparatory Courses Kate ina Valentová Kate ina Valentová Kate ina Valentová (Gar.)	Z,ZK	2	2D	L	PJ
BIE-EEC	English language external certificate Zden k Muziká Zden k Muziká Zden k Muziká (Gar.)	Z	4	2D	L	PJ
BI-ANG	English Language, Internal Certificate Kate ina Valentová Kate ina Valentová Kate ina Valentová (Gar.)	ZK	2	2D	Z,L	PJ

Characteristics of the courses of this group of Study Plan: Code=BI-ZKA.21 Name=English Language Exam

BI-ANG1	English Language Examination without Preparatory Courses	Z,ZK	2			
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.					
BI-ANG						
			<u> </u>			
Course information and	teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-ANG					

Name of the block: Elective courses

Minimal number of credits of the block: 0

The role of the block: V

Code of the group: BI-V.2021

Name of the group: Purely Elective Courses of Bachelor Programme Informatics, version from 2021/22 till 2024/25

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
BI-ADW.1	Windows Administration Ji í Kašpar, Miroslav Prágl Miroslav Prágl Miroslav Prágl (Gar.)	Z,ZK	4	2P+1C	Z	V
BI-ALO	Algebra and Logic Jan Starý Jan Starý Jan Starý (Gar.)	Z,ZK	4	2P+1C	L	V
BI-AVI.21	Algorithms visually Lud k Ku era Lud k Ku era (Gar.)	Z,ZK	4	2P+1C	L	V
BI-A2L	English language, preparation for the B2 level exam Kate ina Valentová Kate ina Valentová Kate ina Valentová (Gar.)	Z	2	2C	L	V
NI-AFP	Applied Functional Programming Robert Pergl, Marek Suchánek, Daniel N mec Robert Pergl Robert Pergl (Gar.)	КZ	5	2P+1C	L	V
BI-BLE	Blender Lukáš Ba inka Lukáš Ba inka Lukáš Ba inka (Gar.)	Z,ZK	4	2P+2C	L	V
NI-DSP	Database Systems in Practes Tomáš Vichta Tomáš Vichta Tomáš Vichta (Gar.)	Z,ZK	4	2P+1C	L	V
NI-PSD	Public Services Design David Pešek, Ond ej Brém David Pešek Ond ej Brém (Gar.)	KZ	4	1P+2C		V
BIE-DIF	Differential equations Antonella Marchesiello, Jan Valdman, Ond ej Bouchala Tomáš Kalvoda Ond ej Bouchala (Gar.)	Z,ZK	5	2P+2C	L	V
NI-DZO	Digital Image Processing	Z,ZK	4	2P+1C	L	V
NI-DDM	Distributed Data Mining	KZ	4	3C	L	V

BI-EP1.24	Effective programming 1 Martin Ka er Martin Ka er (Gar.)	KZ	4	2P+2C	Z	V
BI-EP2	Efficient Programming 2 Martin Ka er Martin Ka er (Gar.)	KZ	4	2P+2C	L	V
BI-ANGK	English language, contact preparation for the B2 level exam Kate ina Valentová Kate ina Valentová (Gar.)	Z	2	2C	Z,L	V
BI-EJK	Enterprise Java and Kotlin Jif Dan ek Jif Dan ek Jif Dan ek (Gar.)	Z,ZK	4	2P+2C	L	V
BI-HAM	HW accelerated network traffic monitoring Tomáš ejka, Karel Hynek Tomáš ejka Tomáš ejka (Gar.)	KZ	4	2P+1C	L	V
BI-HMI	History of Mathematics and Informatics Alena Šolcová Alena Šolcová Alena Šolcová (Gar.)	Z,ZK	3	2P+1C	L	V
BI-ARD	Interactive applications on Arduino Jan ezní ek, Ji í Cvr ek, Robert Hülle, Vojt ch Miškovský Robert Hülle Robert Hülle (Gar.)	KZ	4	3C	L	V
NI-IAM	Internet and Multimedia	Z,ZK	4	2P+1C	L	V
BIE-CSI	Introduction to Computer Science Christoph Kirsch Christoph Kirsch (Gar.)	Z	2	2C	Z	V
FITE-EHD	Introduction to European Economic History Tomáš Evan	Z,ZK	3	2P+1C	L	V
BIE-IMA2	Introduction to Mathematics 2	Z	2	1C	Z	V
BI-CS2	C# language and data access Pavel Št pán Pavel Št pán Pavel Št pán (Gar.)	KZ	4	0P+3C	Z	V
BI-CS3	Language C# - design of web applications Pavel Št pán Pavel Št pán Pavel Št pán (Gar.)	KZ	4	3C	Z	V
BI-SQL.1	Language SQL, advanced Michal Valenta Michal Valenta Michal Valenta (Gar.)	KZ	4	3C	L	V
BI-QAP	Quantum algorithms and programming Tomáš Kalvoda, Ivo Petr Ivo Petr Ivo Petr (Gar.)	KZ	5	1P+2C	Z	V
NI-LSM	Statistical Modelling Lab Kamil Dedecius Kamil Dedecius Kamil Dedecius (Gar.)	KZ	5	3C	L	V
BI-HAS	Human Aspects in Cryptography and Security Ivana Trummová Ivana Trummová Ivana Trummová (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-MPL	Managerial Psychology Jan Fiala Jan Fiala Jan Fiala (Gar.)	ZK	2	2P	Z,L	V
NI-MSI	Mathematical Structures in Computer Science Jan Starý	Z,ZK	4	2P+1C	L	V
BI-MPP.21	Methods of interfacing peripheral devices Miroslav Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-MIT	Milosiav Skrbek Milosiav Skrbek (Gar.) Mikrotik technologies Jan Fesl Jan Fesl Jan Fesl (Gar.)	KZ	3	1P+2C	Z	V
NI-MOP	Modern Object-Oriented Programming in Pharo	KZ	4	3C	Z	V
BI-MVT.21	Jan Blizni enko Robert Pergl Robert Pergl (Gar.) Modern Visualisation Technologies	Z,ZK	5	2P+2C	Z	V
BI-MMP	Ji í Chludil, Petr Pauš Petr Pauš Petr Pauš (Gar.) Multimedia team project Zda ka cabavá Zda ka cabavá Zda ka cabavá (Car.)	KZ	4	3C	Z,L	V
BI-ORL	Zde ka echová Zde ka echová Zde ka echová (Gar.) Operations Research and Linear Programming	KZ	5	1P+2C	L	V
NI-OLI	Dušan Knop Dušan Knop Dušan Knop (Gar.) Linux Drivers	Z,ZK	4	2P+2C	L	V
BI-ACM	Miroslav Skrbek, Jaroslav Borecký Jaroslav Borecký Miroslav Skrbek (Gar.) Programming Practices 1 Tomáš Valla, Tomáš Valla, Car.)	KZ	5	4C	L	V
BI-ACM2	Tomáš Valla Tomáš Valla Tomáš Valla (Gar.) Programming Practices 2 Ord si Suphi Tomáš Valla Tomáš Valla	KZ	5	4C	Z	V
BI-ACM3	Ond ej Suchý, Tomáš Valla Tomáš Valla Tomáš Valla (Gar.) Programming Practices 3 Ord ej Suchý, Tomáš Valla, Tomáš Valla, Tomáš Valla (Gar.)	KZ	5	4C	L	V
BI-ACM4	Ond ej Suchý, Tomáš Valla Tomáš Valla Tomáš Valla (Gar.) Programming Practices 4 Ond aj Suphí Tomáš Valla Tomáš Valla Ond aj Suphí (Car.)	KZ	5	4C	Z	V
BI-AND.21	Ond ej Suchý, Tomáš Valla Tomáš Valla Ond ej Suchý (Gar.) Programming for the Android Operating System	KZ	4	3C	L	V
BI-CS1	Jan Mottl, Jan Vep ek, Marek Kodr, Petr Šíma Jan Mottl Marek Kodr (Gar.) Programming in C# Pavel Št pán, Helena Wallenfelsová Helena Wallenfelsová Pavel Št pán (Gar.)	KZ	4	3C	L,Z	V
BI-PJV	Orgramming in Java Miroslav Balík, Jan Blizni enko, Ji í Borský, Jan Zimolka Miroslav Balík Miroslav Balík (Gar.)	Z,ZK	4	2P+2C	Z,L	V
BI-KOT	Programing in Kotlin Ji í Dan ek Ji í Dan ek Ji í Dan ek (Gar.)	Z,ZK	4	2P+2C	L	V
NI-PSL	Programming in Scala Ji í Dan ek Ji í Dan ek Ji í Dan ek (Gar.)	Z,ZK	4	2P+1C	Z	V
BI-PMA	Programming in Mathematica Zden k Buk Zden k Buk Zden k Buk (Gar.)	Z,ZK	4	2P+2C	Z,L	V

BI-PS2	Programming in shell 2 Lukáš Ba inka	Z,ZK	4	2P+2C	L	V
NI-PDD	Data Preprocessing	Z,ZK	5	2P+1C	Z	V
ві-ркм	Marcel Ji ina Marcel Ji ina Marcel Ji ina (Gar.) Introduction to mathematics	, Z	4	21.110	 Z	v
	Tomáš Kalvoda Tomáš Kalvoda Tomáš Kalvoda (Gar.) Reverse Engineering			45.00		
NI-REV	Josef Kokeš Josef Kokeš Josef Kokeš (Gar.)	Z,ZK	5	1P+2C	Z	V
BI-SCE1	Computer Engineering Seminar I Hana Kubátová Hana Kubátová (Gar.)	Z	4	2C	L,Z	V
BI-SCE2	Computer Engineering Seminar II Hana Kubátová Hana Kubátová (Gar.)	Z	4	2C	L,Z	V
BI-ST1	Network Technology 1 Alexandru Moucha Alexandru Moucha (Gar.)	Z	3	2C	Z	V
BI-ST2	Network Technology 2 Alexandru Moucha Alexandru Moucha (Gar.)	Z	3	3C	L	V
BI-ST3	Network Technology 3 Alexandru Moucha Alexandru Moucha (Gar.)	Z	3	2C	Z	V
BI-ST4	Network Technology 4	Z	3	2C	L	V
BI-SKJ.21	Alexandru Moucha Alexandru Moucha (Gar.) Scripting Languages	Z,ZK	4	2+2		V
	Lukáš Ba inka, Jan Ž árek Lukáš Ba inka Jan Ž árek (Gar.) World Economy and Business					
FIT-SEP	Tomáš Evan	Z,ZK	4	2P+2C	L	V
BI-SEP	World Economy and Business Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)	Z,ZK	4	2P+2C	L	V
NI-SYP	Parsing and Compilers Jan Janoušek Jan Janoušek (Gar.)	Z,ZK	5	2P+1C	Z	V
BIE-SEG	Systems Engineering Christoph Kirsch Christoph Kirsch (Gar.)	Z	0	2C	Z	V
TVK1	Physical Education Luboš Neuman Ji í Drnek (Gar.)	Z	1		L,Z	V
TVV	Physical education	Z	0	0+2	Z,L	V
TV1	Physical Education	Z	0	0+2	Z	V
TVV0	Physical education	Z	0	0+2	Z,L	V
TV2	Physical Education	Z	0	0+2	L	V
TVKLV	Physical Education Course	Z	0	7dní	L	V
TVKZV	Physical Education Course	Z	0	7dní	Z	V
BI-TS1	Theoretical Seminar I Dušan Knop, Ond ej Suchý, Tomáš Valla Tomáš Valla Tomáš Valla (Gar.)	Z	4	2C	Z	V
BI-TS2	Ducan rance Theoretical Seminar II Dušan Knop, Ond ej Suchý, Tomáš Valla Tomáš Valla Ond ej Suchý (Gar.)	Z	4	2C	L	V
BI-TS3	Theoretical Seminar III Ond ej Suchý, Tomáš Valla Tomáš Valla (Gar.)	Z	4	2C	Z	V
BI-TS4	Theoretical Seminar IV	Z	4	2C	L	V
NI-TSP	Ond ej Suchý, Tomáš Valla Tomáš Valla Tomáš Valla (Gar.) Testing and Reliability	Z,ZK	5	2P+2C	 Z	V
INFT OF	Petr Fišer Martin Da hel Petr Fišer (Gar.) Quality Assurance	∠,∠n	5	26 +20	2	v
BI-QUA	Marek Kodr, Martin Pilný, Kate ina Kalášková Kate ina Kalášková Marek Kodr (Gar.)	ΚZ	4	3C	Z	V
FI-TOP	Academic writing Tomáš Nová ek	Z	2	10B	Z	V
BI-CCN	Compiler Construction Christoph Kirsch Christoph Kirsch (Gar.)	Z,ZK	5	2P+1C	L	V
BI-TEX	TeX and Typography	Z,ZK	4	2P+1C	L	V
BI-EHD	Petr Olšák Petr Ölšák Petr Olšák (Gar.) Introduction to European Economic History	Z,ZK	3	2P+1C	Z,L	V
	Tomáš Evan Tomáš Evan Tomáš Evan (Gar.) Cultural and Social Anthropology					•
BI-KSA	Tomáš Houdek, Alena Libánská, Jakub Šenovský Jakub Šenovský Alena Libánská (Gar.)	ZK	2	2P	Z,L	V
BI-ULI	Introduction to Linux Zden k Muziká, Petr Zemánek, Jan Žárek Zden k Muziká Zden k Muziká (Gar.)	Z	2	4D	Z	V
NI-VCC	Virtualization and Cloud Computing Tomáš Vondra, Jan Fesl Tomáš Vondra Tomáš Vondra (Gar.)	Z,ZK	5	2P+1C	L	V
BI-VR1	Virtual reality I Petr Pauš, Petr Klán Petr Klán Petr Klán (Gar.)	KZ	4	2P+2C	L,Z	V
BI-VR2	Virtual reality II	KZ	3	1P+2C	L	V
BI-VAK.21	Petr Klán Petr Klán Petr Klán (Gar.) Selected Applications of Combinatorics	Z	3	2R	L	V
	Michal Opler Michal Opler Michal Opler (Gar.)	۲		211	L	v

BI-VMM	Selected Mathematical Methods Marzieh Forough Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	4	2P+2C	L	V
NI-VYC	Computability Jan Starý Jan Starý Jan Starý (Gar.)	Z,ZK	4	2P+2C	L	V
BI-ZS10	Bachelor internship abroad for 10 credits Zden k Muziká Zden k Muziká (Gar.)	Z	10		Z,L	V
BI-ZS20	Bachelor internship abroad for 20 credits Zden k Muziká Zden k Muziká (Gar.)	Z	20		Z,L	V
BI-ZS30	Bachelor internship abroad for 30 credits Zden k Muziká Zden k Muziká (Gar.)	Z	30		Z,L	V
BI-ZIVS	Intelligent Embedded System Fundamentals Miroslav Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.)	KZ	4	1P+3C	Z	V
BI-ZPI	Process engineering Robert Pergl Robert Pergl (Gar.)	KZ	4	1P+2C	L	V
BI-IOS	Fundamentals of iOS Application Development for iPhone and iPad Rostislav Babá ek, Igor Rosocha Martin P Ipitel Martin P Ipitel (Gar.)	KZ	4	2C	Z	V
BI-ZWU	Introduction to Web and User Interfaces Lukáš Ba inka Lukáš Ba inka Jakub Klímek (Gar.)	Z,ZK	4	2P+2C	L	V
BI-3DT.1	3D Printing Miroslav Hron ok, Tomáš Sýkora Tomáš Sýkora Miroslav Hron ok (Gar.)	KZ	4	3C	L	V

Characteristics of the courses of this group of Study Plan: Code=BI-V.2021 Name=Purely Elective Courses of Bachelor Programme Informatics, version from 2021/22 till 2024/25

BI-MVT.21	Modern Visualisation Technologies	Z,ZK	5
The goal of the course is	s to give an overview of modern visualization technologies and their principles, namely technologies related to virtual and au	gmented reality, v	isualization on
high resolution displays	(e.g., SAGE and video mapping) and their applications in practice. Several lectures deal with the content creation for the menti	oned technologies	s, namely fractal
and procedural visualiza	ttion, scientific data visualization, and 3D model scanning.		
TV1	Physical Education	Z	0
TVV	Physical education	Z	0
TVK1	Physical Education	Z	1
TVV0	Physical education	Z	0
TV2	Physical Education	Z	0
TVKZV	Physical Education Course	Z	0
TVKLV	Physical Education Course	Z	0
BI-ADW.1	Windows Administration	Z,ZK	4
	d in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	,	
BI-ALO	Algebra and Logic	Z,ZK	4
	I deepens the study of topics touched upon in the basic course in logic.	_,,	
BI-AVI.21	Algorithms visually	Z,ZK	4
	is other algorithm courses at FIT. It brings knowledge about particular important algorithms from different fields of the compute	· .	-
	BI-AG1 and BI-AG2. A wide scope of covered subject is made possible due to using visualization bz Algovision (www.algovision.or		-
	g the principles of algorithms easy.	3,	,
BI-A2L	English language, preparation for the B2 level exam	Z	2
	se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achieveme	1	
	ge instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both		
	ate set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by i		
class of the term.			U U
NI-AFP	Applied Functional Programming	KZ	5
NI-AFP	Applied Functional Programming d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional	1	-
NI-AFP This course is presented		al programming la	nguages are on
NI-AFP This course is presented the rise nowadays and t	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional	al programming la	nguages are on
NI-AFP This course is presented the rise nowadays and t	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast	al programming la	nguages are on
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice.	al programming la cering this paradig Z,ZK	nguages are on m becomes a 4
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends know	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender	al programming la ering this paradig Z,ZK interested in 3D	nguages are on m becomes a 4 graphics and
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends know	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those nplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic	al programming la ering this paradig Z,ZK interested in 3D	nguages are on m becomes a 4 graphics and
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes	al programming la iering this paradig Z,ZK interested in 3D is applications) co	nguages are on m becomes a 4 graphics and urse.
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech.	al programming la iering this paradig Z,ZK interested in 3D is applications) co	nguages are on m becomes a 4 graphics and urse.
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes	al programming la ering this paradig Z,ZK e interested in 3D es applications) co Z,ZK KZ	nguages are on m becomes a 4 graphics and urse. 4 4
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design	al programming la ering this paradig Z,ZK e interested in 3D es applications) co Z,ZK KZ t process from the	nguages are on m becomes a 4 graphics and urse. 4 4 e perspective of
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development	al programming la ering this paradig Z,ZK e interested in 3D es applications) co Z,ZK KZ t process from the	nguages are on m becomes a 4 graphics and urse. 4 4 e perspective of
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those nplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratic ents-designers as well as clients.	Al programming la pering this paradig Z,ZK interested in 3D is applications) co Z,ZK KZ KZ at process from the pon with client repre-	nguages are on m becomes a 4 graphics and urse. 4 4 e perspective of
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender wledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration	Al programming la programming la programming this paradig Z,ZK interested in 3D is applications) co Z,ZK KZ KZ At process from the pro with client repro- Z,ZK	nguages are on m becomes a 4 graphics and urse. 4 4 e perspective of esentatives. 5
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a for	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those nplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratio ents-designers as well as clients. Differential equations	Al programming la pering this paradig Z,ZK interested in 3D is applications) co Z,ZK KZ KZ At process from the process from the C,ZK Al solution method	nguages are on m becomes a 4 graphics and urse. 4 4 e perspective of esentatives. 5 s like separation
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theorem	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those nplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratic ents-designers as well as clients. Differential equations Dual dational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essential	Al programming la programming la programming la z,ZK interested in 3D is applications) co Z,ZK KZ KZ At process from the process from the con with client repro- Z,ZK Al solution methods with methods like	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 s like separation characteristic
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theorem polynomial analysis, follow	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those on plete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratio ents-designers as well as clients. Differential equations oundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentia ms on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered on the system of the system.	Al programming la pering this paradig Z,ZK interested in 3D is applications) co Z,ZK KZ KZ At process from the on with client repre- Z,ZK Al solution methods with methods like ons. Finally, an inter-	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 s like separation characteristic roduction to
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theored polynomial analysis, foll partial differential equation	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those on plete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratio ents-designers as well as clients. Differential equations oundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentia ms on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered wowed by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world application.	Al programming la pering this paradig Z,ZK interested in 3D is applications) co Z,ZK KZ KZ At process from the on with client repre- Z,ZK Al solution methods with methods like ons. Finally, an inter-	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 s like separation characteristic roduction to
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theored polynomial analysis, foll partial differential equation	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those nplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratio ents-designers as well as clients. Differential equations oundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentiat no on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered to over diverse of non-linear models such as predator-prey and epidemiological models to showcase real-world applications (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODE	Al programming la pering this paradig Z,ZK interested in 3D is applications) co Z,ZK KZ KZ At process from the on with client repre- Z,ZK Al solution methods with methods like ons. Finally, an inter-	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 s like separation characteristic roduction to
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theorem polynomial analysis, folli- partial differential equati and explicit Euler method NI-DZO	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those nplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and developmer ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration on Automational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentia no existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered to over diverse to specific to multi-variable contexts. The course will also cover numerical methods for solving ODE ds, Runge-Kutta methods, and finite element methods for both ODEs and PDEs.	Al programming la programming	A graphics and urse. 4 graphics and urse. 4 4 a perspective of esentatives. 5 s like separation characteristic roduction to uding implicit 4
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theorem polynomial analysis, folli partial differential equati and explicit Euler method NI-DZO This course presents a	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratio ents-designers as well as clients. Differential equations oundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentiat no existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered to oved by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world applications (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODE ds, Runge-Kutta methods, and finite element methods for both ODEs and PDEs. Digital Image Processing	Al programming la programming	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 s like separation characteristic roduction to uding implicit 4 a both easy to
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theorem polynomial analysis, folli- partial differential equati and explicit Euler method NI-DZO This course presents a implement and have an i	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboratio ents-designers as well as clients. Differential equations oundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentiat so existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered to oved by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world applications (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODE ds, Runge-Kutta methods, and finite element methods for both ODEs and PDEs. Digital Image Processing comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical at the processing comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical at the processing comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical at the processing comprehensive overview of modern methods for interactive editing of digital images a	Al programming la sering this paradig Z,ZK interested in 3D is applications) co Z,ZK Al process from the on with client repre- Z,ZK Al solution methods with methods like ons. Finally, an inter- is and PDEs, inclu- Z,ZK Algorithms that areas also valuable out	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 slike separation characteristic roduction to uding implicit 4 a both easy to side the domain
NI-AFP This course is presented the rise nowadays and t necessary competence BI-BLE The course extends kno animation. It offers a cor NI-DSP This course is presented NI-PSD The course will introduc suppliers (devs and des Course is aimed at stud BIE-DIF This course provides a fo of variables. Key theorem polynomial analysis, folli- partial differential equati and explicit Euler method NI-DZO This course presents a implement and have an i of digital image process	d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional he functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mast of a software engineer: the theory and especially the practice. Blender Weldge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those mplete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graphic Database Systems in Practes d in Czech. Public Services Design e students to specifics of UX, Service design and development for public sector. We will look into the design and development ignesr) as well as clients. Differential equations oundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essentiations over year of one-linear models such as predator-prey and epidemiological models to showcase real-world applications (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODE ds, Runge-Kutta methods, and finite element methods for interactive editing of digital images and video. It mainly deals with practical anteresting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is	Al programming la sering this paradig Z,ZK interested in 3D is applications) co Z,ZK Al process from the on with client repre- Z,ZK Al solution methods with methods like ons. Finally, an inter- s and PDEs, inclu- Z,ZK Algorithms that areas a also valuable out compression, de	A graphics and urse. 4 graphics and urse. 4 a perspective of esentatives. 5 slike separation characteristic roduction to uding implicit 4 both easy to side the domain -blurring in

		1/7	4
NI-DDM	Distributed Data Mining	KZ KZ	4
	e-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain han	-	-
	ork Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation	ns and will be capa	able to propose
	e other algorithms. The course is prezented in czech language.	1/7	
BI-EP1.24	Effective programming 1	KZ	4
The course is taught in			
BI-EP2	Efficient Programming 2	KZ	4
	Programming 1. Students will practice implementation of algorithms by solving typical problems. Various ways of solving inc	lividual problems	are discussed,
	he best one and avoid implementation errors.	_	r
BI-ANGK	English language, contact preparation for the B2 level exam	Z	2
	se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement		
	age instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both		
	ate set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by	individual teacher	rs during the first
class of the term.			ſ
BI-EJK	Enterprise Java and Kotlin	Z,ZK	4
	ced technologies in the Java and Kotlin programming languages. The focus is on technologies for developing enterprise infor	mation systems v	vith microservice
architecture, that can be		1	1
BI-HAM	HW accelerated network traffic monitoring	KZ	4
	students to modern and widely used technologies and principles in the area of network infrastructure and traffic monitoring.	-	-
	fatory skills to network operators (planning and development of resources and infrastructure) and security analysts alike (as		
	of the course are to acquaint students with the modern trends and cornerstone principles in the area of monitoring network t	traffic on a hardwa	are and software
	ir practical abilities in this field.		
BI-HMI	History of Mathematics and Informatics	Z,ZK	3
This course is presente	d in Czech.		
BI-ARD	Interactive applications on Arduino	KZ	4
The subject is designed	for students of first grade of bachelor study as introduction to embedded systems. Students will learn how to design simple app	lications for mode	n programmable
kits and control varied p	eripherals with help of available libraries. The goal of the subject is to show varied software approaches to control embedded	d systems, i.e. to s	see the results
not only on display of a	PC. Thanks to possible control on higher (objective) layer, this platform is frequently used for artist performance and therefor	e is suitable even	for Web and
Software Engineering s	tudents.		
NI-IAM	Internet and Multimedia	Z,ZK	4
The NI-IAM course is for	cused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes a	cquisition of AV si	gnals (input),
presentation of AV signa	als (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practic	cal use case scen	arios of real-time
audiovisual transmissio	ns. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the	effect of various of	components on
the quality and latency	of AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recordin	g the scene up to	the presentation
for audience.			
BIE-CSI	Introduction to Commuter Calence		
	Introduction to Computer Science	Z	2
This is an introductory of	lass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other	er fields but intere	sted in computer
This is an introductory of		er fields but intere	sted in computer
This is an introductory of science, high-school stu and relate basic princip	lass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra	er fields but intere goal of the class amming languages	sted in computer is to introduce and tools are
This is an introductory of science, high-school stu and relate basic princip done the way they are,	lass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer	er fields but intere goal of the class amming languages not just basic cor	sted in computer is to introduce and tools are nputer science
This is an introductory of science, high-school stuand relate basic princip done the way they are, questions but also questions	lass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte	er fields but intere goal of the class amming languages not just basic cor	sted in computer is to introduce and tools are nputer science
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before.	a goal of the class goal of the class amming languages not just basic cor erested in comput	sted in computer is to introduce s and tools are nputer science er science more
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also ques than expected, or even FITE-EHD	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before.	a goal of the class amming languages not just basic cor erested in comput	sted in computer is to introduce s and tools are nputer science er science more
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also ques than expected, or even FITE-EHD The course introduces a	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of	ar fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through	sted in computer is to introduce s and tools are nputer science er science more 3 the description
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic	ar fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins	economy through it interest goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is decipho	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed	Alass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an	economy through it interest goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is decipho	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion.	er fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class
This is an introductory of science, high-school str and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and exp	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion.	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples.	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intre- less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are the students understand basic math	a fields but interee goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphed organizations in Z re able to apply th	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class
This is an introductory of science, high-school str and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and exp	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class
This is an introductory of science, high-school str and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and exe examples. BI-CS2	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intre- less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are the students understand basic math	a fields but interee goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphed d organizations in Z re able to apply th	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use	Alass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte- less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they a C# language and data access ata access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te	eri fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. The chnologies such a	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intr less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are at access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL	a fields but interee goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphed d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects)	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML
This is an introductory of science, high-school stuand relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD . The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 . Students refresh and examples. BI-CS2 . The C# language and do get to know objects use of features for querying and LINQ to SQL). Ano	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are at a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data there objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data	er fields but intere e goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. The chnologies such a L (LINQ to Objects a using domain-sp	the description arge economic history. Class 2 hem in particular 4 he students will as LINQ - a set s, LINQ to XML pecific objects
This is an introductory of science, high-school stuand relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD . The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 . Students refresh and examples. BI-CS2 . The C# language and c get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the	Aass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intr less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are at access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL	er fields but intere e goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. The chnologies such a L (LINQ to Objects a using domain-sp	the description arge economic history. Class 2 hem in particular 4 he students will as LINQ - a set s, LINQ to XML pecific objects
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and d get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description).	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are at access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mat- course introduces Code First, Da	er fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. The chnologies such a L (LINQ to Object: a using domain-sp odel, Storage Moo	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are at a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micd d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQ ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Ma Language C# - design of web appl	a goal of the class a goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphed d organizations in Z tre able to apply th kZ crosoft platform. The chnologies such a L (LINQ to Object: a using domain-spodel, Storage Moc KZ	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping
This is an introductory of science, high-school stuand relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and examples. BI-CS2 The C# language and c get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be introduced and the students withe stude	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intr less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they a and access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mo Language C# - design of web applicati	a goal of the class a goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphed d organizations in Z tre able to apply th kZ crosoft platform. The chnologies such a L (LINQ to Object: a using domain-spodel, Storage Moc KZ	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and d get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They wi	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intr less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are and eventing to an excess course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQI ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mat Language C# - desig	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moc	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intri- on thisplatform. They will BI-SQL.1	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progre- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inter- tess than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they as at access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQ ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mat- Language C# - design of web appli	a fields but intere g goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From latitutions is deciphed d organizations in Z re able to apply th KZ crosoft platform. The chnologies such a L (LINQ to Object: a using domain-speciel, Storage Moor KZ ew of the develope KZ	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ to XML pecific objects lel and Mapping 4 ment possibilities
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on know	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progre- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they as at a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mic do retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current the and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQI ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mat Language C# - design of web applica	re able to apply the class arming languages not just basic corrested in compute a goal of the class arming languages not just basic corrested in compute a comparison of the compute a comparison of the compariso	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 program unites,
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intre- tess than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they at C# language and data access at a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid do retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mid Language C# - design of web applications oduced to current technologies in web application development on the .NET platf	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moc KZ ew of the develope KZ n particular storeco pint of view of spec	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 program unites, cialized database
This is an introductory of science, high-school stuand relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and examples. BI-CS2 The C# language and c get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro on thisplatform. They will BI-SQL.1 Module is based on knot triggers, recursive queri structures like indexes,	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The les of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to an even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are into less than before. Introduction to European Economic History I gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they a ad access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQI ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to k	er fields but intere e goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moo KZ ew of the develop KZ ew of the develop KZ and possibilities	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 program unites, cialized database of its. changes
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri structures like indexes, will be discussed. Lectu	Ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe idents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra- and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are intre- tess than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they at C# language and data access at a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid do retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mid Language C# - design of web applications oduced to current technologies in web application development on the .NET platf	er fields but intere e goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moo KZ ew of the develop KZ ew of the develop KZ and possibilities	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 program unites, cialized database of its. changes
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and d get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri structures like indexes, will be discussed. Lectu PostgreSQL.	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are into less than before. Introduction to European Economic History I gives the student basic knowledge about forming of the global 4 tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they as a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mid d to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mid Language C# - design of web applications ducues to current technologies in web application development on the .NET platform. They will acquire a comprehensive overvir learn to create WebAPI and to use it by client programs.	er fields but intere e goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moo KZ ew of the develop KZ ew of the develop KZ and possibilities acle DBMS and possibilities	sted in computer is to introduce s and tools are inputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 program unites, cialized database of its. changes artially on
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri structures like indexes, will be discussed. Lectur PostgreSQL. BI-QAP	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answere tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are into less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they at a access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micd to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQI ther objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mc Language SQL, advanced wedge obtained	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moo KZ ew of the develope KZ n particular stored particular stored and possibilities acle DBMS and possibilities	sted in computer is to introduce s and tools are inputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 program unites, cialized database of its. changes artially on 5
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri structures like indexes, will be discussed. Lectu PostgreSQL. BI-QAP Course aims at giving st	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answere tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are do to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQI her objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Model Language SQL, advanced Wedge obtained in BI-DBS. Students become familiar with advanced relational and non-relational features of SQL language. I as, OLA	refields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ crosoft platform. Th chnologies such a L (LINQ to Objects a using domain-sp odel, Storage Moo KZ ew of the develop KZ and possibilities acle DBMS and possibilities acle DBMS and possibilities accent a stored based of the develop	sted in computer is to introduce s and tools are nputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 nent possibilities 4 program unites, cialized database of its. changes artially on 5 um technologies
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri structures like indexes, will be discussed. Lectu PostgreSQL. BI-QAP Course aims at giving st are based, and algorith	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in oth idents, anybody with a background in basic math and the desire to understand, early on, what computer science is, why things such as high-evel progre and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are into tess than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are d to retrieve data - connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Dojects, XML and SQI ther objective is the Entity Framework - an object-relational mapper that enables. NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Me Language C# - design of web applications duced to current technologies in web applicational development on the .NET platform. They will acquire a comprehensive overvi II learn to create WebAPI and to use it by client programs. Language SQL, advanced Wedge	re fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ rosoft platform. Th chnologies such a L (LINQ to Object: a using domain-sp odel, Storage Moo KZ ew of the develop KZ ew of the develop KZ and possibilities acle DBMS and pa cs, on which quant opment kit Qiskit,	sted in computer is to introduce s and tools are inputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 t program unites, partially on 5 um technologies which is based
This is an introductory of science, high-school stu and relate basic princip done the way they are, questions but also quest than expected, or even FITE-EHD The course introduces a of the key periods in his area of Roman Empire does not cover detailed meetings will consist of BIE-IMA2 Students refresh and ex- examples. BI-CS2 The C# language and of get to know objects use of features for querying and LINQ to SQL). Ano (ORM). This part of the (XML description). BI-CS3 The students will be intro- on thisplatform. They will BI-SQL.1 Module is based on kno- triggers, recursive queri structures like indexes, will be discussed. Lectu PostgreSQL. BI-QAP Course aims at giving sta are based, and algorith on Python language. Kr	ass on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in othe dents, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The es of computer science for students to understand, early on, what computer science is, why things such as high-level progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answere tions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte less than before. Introduction to European Economic History a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global of tory. As European countries have been dominant actors in this process it focuses predominantly on their roles in the econom to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial ins economic history of particular European countries but rather the impact of trade and role of particular events, institutions an a mixture of lecture and discussion. Introduction to Mathematics 2 tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are do to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current te and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQI her objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Model Language SQL, advanced Wedge obtained in BI-DBS. Students become familiar with advanced relational and non-relational features of SQL language. I as, OLA	re fields but intere goal of the class amming languages not just basic cor erested in comput Z,ZK economy through nic history. From la titutions is deciphe d organizations in Z re able to apply th KZ rosoft platform. Th chnologies such a L (LINQ to Object: a using domain-sp odel, Storage Moo KZ ew of the develop KZ ew of the develop KZ and possibilities acle DBMS and pa cs, on which quant opment kit Qiskit,	sted in computer is to introduce s and tools are inputer science er science more 3 the description arge economic ered. The course history. Class 2 nem in particular 4 ne students will as LINQ - a set s, LINQ to XML pecific objects lel and Mapping 4 ment possibilities 4 rorgram unites, cialized database of its. changes artially on 5 um technologies which is based

NI-LSM	Statistical Modelling Lab	KZ	5
	on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is nd its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms,	-	
	t is on the border of own research and may result in the topic of final work (diploma or bachelor thesis).		
BI-HAS	Human Aspects in Cryptography and Security	Z,ZK	5
This course is for stude	ents interested not only in technical scope of computer science, but also in making products usable - for users and for develop	pers. Students of t	his course can
use their gained knowl	edge to design, plan and analyse their own projects in the context of human-centered security.		
NI-MPL	Managerial Psychology	ZK	2
NI-MSI	Mathematical Structures in Computer Science	Z,ZK	4
	s of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Sco	tt model of lambda	a calculus.
Introduction to categor BI-MPP.21		Z,ZK	5
	Methods of interfacing peripheral devices on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Univ		-
	and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of l		
	ion development, and APIs of selected devices.		
BI-MIT	Mikrotik technologies	KZ	3
The main motivation of	the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are	commonly used by	y the small and
	providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the		
	e and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute e data-link, network and transport layer of the OSI model.	er networks conce	pts like protocols
NI-MOP	Modern Object-Oriented Programming in Pharo	KZ	4
	mming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, wh	· · · —	-
	x modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the		
of object systems in me	odern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their developmen	t needs and areas	s of interest. In
	object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo		-
-	of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct invol		
BI-MMP This course is presented	Multimedia team project	KZ	4
BI-ORL	Operations Research and Linear Programming	КZ	5
-	roduce students to the issues of operational research and primarily to the practical application of linear programming as a fur		-
-	rimarily focuses on the use of engineering methods (with a mathematical background) to solve practical problems (such as n	-	
NI-OLI	Linux Drivers	Z,ZK	4
	stem is an important operating system for personal computer and also for embedded systems. Systems on chip and combinin		
	of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver developm		udents. The
	edge of Linux operating system architecture, principles of development of various types drivers, including practical experience		F
BI-ACM	Programming Practices 1 se for preparing talented student for representation in international programming contests.	KZ	5
BI-ACM2	Programming Practices 2	KZ	5
-	se for preparing talented student for representation in international programming contests.	1 1	-
BI-ACM3	Programming Practices 3	KZ	5
	se for preparing talented student for representation in international programming contests.		
BI-ACM4	Programming Practices 4	KZ	5
	se for preparing talented student for representation in international programming contests.	1/7	4
BI-AND.21 This course is presented	Programming for the Android Operating System	KZ	4
BI-CS1	Programming in C#	KZ	4
	is to introduce .NET Framework as a multi-language development platform. Then, programming language C#, its fundamenta	1 1	-
operators, arrays, loop	s, definitions and calls of functions will be discussed. Attention is focused on the object oriented programming in C# - class de	finition and class	instancing,
	properties, static members, Garbage Collector, inheritance and polymorphism, collections, delegates, and generics. Debugg	ing and exception	processing, as
well as work with files a			
BI-PJV	Programming in Java	Z,ZK	4
BI-KOT	ed in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Programing in Kotlin	Z,ZK	4
	ically-styled object-functional language that exploits the extensive Java language ecosystem while delivering a number of adv	1 1 1	-
	ava compliant and allows for mixed projects that preserve existing parts written in Java, and continue with the development of		
with minimum of boiler	plate code. Last but not least, Kotlin is suitable for designing of DSLs (Domain-Specific Languages).		-
NI-PSL	Programming in Scala	Z,ZK	4
	the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language fea		-
advance standard libra Scalaz, etc.	ry. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks	and libraries e.g. I	Play, Cassandra,
BI-PMA	Programming in Mathematica	Z,ZK	4
	g with modern technical and scientific software. Students will learn how to use different programming styles (functional program		•
	amic interactive applications and visualisations, data processing and presentations.		F - 3. s
BI-PS2	Programming in shell 2	Z,ZK	4
	al overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In ad		
	ner particular scripting languages and will get practical experience with shell script programming.		
NI-PDD	Data Preprocessing	Z,ZK	5
	are raw data for further processing and analysis. They learn what algorithms can be used to extract information from various da		-
time series, etc., and le pages.	earn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction of characte	nauca nom image	S OF HOTH WED
BI-PKM	Introduction to mathematics	Z	4
This course is presente		. – 1	

NI-REV	Reverse Engineering	Z,ZK	5
Students will get acqua	inted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens	before and after t	he main function
is called. Students will	understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is de	dicated to reverse	engineering of
applications written in (C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be o	ledicated to debug	ggers: how
debuggers and debugg	ing work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the compu	ter malware scene	e. The focus of
the course is on the se	minars, where students will solve practically oriented tasks from the real world.		
BI-SCE1	Computer Engineering Seminar I	Z	4
The Seminar of Compu	ter Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant	ce to failures and a	attacks. Students
are approached individ	ually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of	the subject is wor	k with scientific
articles and other profe	ssional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar tea	chers. The topics	are new for each
semester.	-		
BI-SCE2	Computer Engineering Seminar II	Z	4
The Seminar of Compu	ter Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistan	ce to failures and a	attacks. Students
are approached individ	ually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of	the subject is wor	k with scientific
articles and other profe	ssional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar tea	chers. The topics	are new for each
semester.			
BI-ST1	Network Technology 1	Z	3
The subject is oriented	to providing the students basic information and practical skills from the area of digital and IP networks. The subject is acredit	ed under the Cisc	o Netacad -
CCNA1 - R&S Inti	oduction to Networks.		
BI-ST2	Network Technology 2	Z	3
This course is presente		-	-
BI-ST3	Network Technology 3	Z	3
	hance their knowledge acquired from previous BI-ST1 and BI-ST2 courses. Principles of routing and switching presented duri	1	-
	the course. Students will be able to start fine-tune protocols' settings to gain certain advantages like increased efficiency, pre-	-	
simple topology, securi		aletability, esterio	ion boyona a
BI-ST4	Network Technology 4	Z	3
	hance their knowledge already acquired from previous BI-ST1, BI-ST2, and BI-ST3 courses. Principles of routing and switch	-	-
	ther extended in BI-ST3. Students were able to start fine-tune protocols' settings to gain certain advantages like increased ef		-
s a			
	gy, security, etc. This module teaches students to configure and fine-tune Wide Area Networks and to experience a complete ess) which radically differs from well-known Ethernet (broadcast) type of networks. Students will also manage router and swi		-
	ercy procedures. Also the security aspect is treated; students will learn possible intra- and inter-network attacks and the mitig		-
network running.		auon ways while	
		7 71/	4
BI-SKJ.21	Scripting Languages	Z,ZK	4
	I overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In ad	dition, they gain a	a deeper insight
	er particular scripting languages and will get practical experience with shell script programming.		
FIT-SEP	World Economy and Business	Z,ZK	4
	d in Czech. The course introduces students of technical university to the international business. It does that predominantly by		
	d economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as we		
	ic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form	of discussions bas	sed on individual
-	o take bachelor level of this course BIE-SEP as a prerequisite.		
BI-SEP	World Economy and Business	Z,ZK	4
This course is presente	d in Czech. The course introduces students of technical university to the international business. It does that predominantly be	y comparing indivi	dual countries
and key regions of work	d economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as we	Il as indexes of ec	onomic freedom,
corruption and econom	ic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form	of discussions bas	sed on individual
readings. It is advised t	o take bachelor level of this course BIE-SEP as a prerequisite.		
NI-SYP	Parsing and Compilers	Z,ZK	5
The module builds upor	the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge	of various variants	and applications
of LR parsing and are i	ntroduced to special applications of parsers, such as incremental and parallel parsing.		
BIE-SEG	Systems Engineering	Z	0
	class on systems engineering for bachelor students in computer science. The goal of the class is to introduce basic principles	of operating syst	ems for students
to understand processo	or and memory virtualization. Seeing and actually understanding virtualization is the overarching theme of the class. After tak	ing the class, stud	lents are able to
understand the differen	ce between processes and threads as well as emulation and virtualization, what virtual memory is and how it works, what co	oncurrency is, as c	opposed to
	ocesses and threads synchronize efficiently to overcome concurrency for communication.	•	
BI-TS1	Theoretical Seminar I	Z	4
	ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a cla	1	1
	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course i		-
-	e. The capacity is limited by the the potentials of the teachers of the seminar.		
BI-TS2	Theoretical Seminar II	Z	4
	ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a cla	1	-
	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course i		-
-	e. The capacity is limited by the the potentials of the teachers of the seminar.	3 a work with sole	
		7	4
BI-TS3	Theoretical Seminar III	Z	4
	ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a cla		-
-	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course i	s a work with scie	nulle papers and
	e. The capacity is limited by the the potentials of the teachers of the seminar.		
BI-TS4	Theoretical Seminar IV	Z	4
	ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a cla		-
-	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course i	s a work with scie	ntific papers and
-	e. The capacity is limited by the the potentials of the teachers of the seminar.		r
NI-TSP	Testing and Reliability	Z,ZK	5
-	ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to		-
	ization and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with	1 built-in-self-test	equipment. They
will be able to compute	, analyze, and control the reliability and availability of the designed circuits.		

BI-QUA Quality Assurance	KZ	4
This course introduces students to the fundamentals of testing and quality management. Students will learn what the role of a tester is in the context	1	s of software
development and will experience hands-on application testing using both manual and automated testing. At the end of the semester, the student sh	ould be prepared	to perform a test
analysis, design a set of test scenarios, prepare test data, automate an appropriate portion of the scenarios, and prepare a report on the bugs foun	d in the product ur	nder test.
FI-TOP Academic writing	Z	2
Publishing is an important and required part of research activity. It is not only about obtaining research results but also about applying them in the format and required part of research activity. It is not only about obtaining research results but also about applying them in the format and required part of research activity.	orm of publication.	Writing scientific
publications can be useful for students not only in their own publishing activities but also in the preparation of a bachelor's or master's thesis. In the		
write a scientific article, what parts such an article should have, and how the peer review process works. Students will also try their hand at presenting	-	-
else's article. The course will be taught in blocks, with one lecture at the beginning of the semester and one practicum in the middle of the semester	. Dates will be det	ermined based
on the availability of enrolled students.	7 71/	
BI-CCN Compiler Construction	Z,ZK	5
This is an introductory class on compiler construction for bachelor students in computer science. The goal of the class is to introduce basic principle understand the design and implementation of programming languages. Seeing and actually understanding self-compilation is the overarching them	-	students to
	1	4
BI-TEX TeX and Typography This course is presented in Czech. This course gives basics of programming in TeX (plain TeX, ConTeXt, LaTeX, OpTeX, LuaTeX). Te second part of	Z,ZK	1
rules.		s on typographic
BI-EHD Introduction to European Economic History	Z,ZK	3
This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).		
BI-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 div	1	
anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, h		•
shown. The course is presented in Czech.		. ,
BI-ULI Introduction to Linux	Z	2
Students become familiar with the basics of the Linux operating system using e-learning form. They learn to work with the command line and become	ne familiar with ba	sic commands
and techniques of a Unix-like system. Topics can be studied first theoretically and then practically verified in a virtual machine (terminal).		
NI-VCC Virtualization and Cloud Computing	Z,ZK	5
Students will gain knowledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies ar	nd organizations. T	hey will get
acquainted with virtualization principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to el	ficiently operate an	nd optimize the
performance parameters of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effect	tive technology to	day for the
management of complex computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical sk	ills in the use of me	odern integration
and development tools (Continuous integration and development).		
BI-VR1 Virtual reality I	KZ	4
Introduction to Virtual Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the rules and requirement		
The course focuses on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves of a solid standard excited ended and the solid standard excited ended and the solid standard end	computational thin	king, empathy
and shared social activities.	1/7	0
BI-VR2 Virtual reality II	KZ	3
Continuation of the course Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The for computer science and gamification in various social metaverse and desktop engines.	objective is to devi	elop applications
	Z	3
BI-VAK.21 Selected Applications of Combinatorics The course aims to introduce students in an accessible form to various branches of theoretical computer science and combinatorics. In contrast to t		-
issue from applications to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some l		
with the active participation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical)		
will select problems to be solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optim		
also try to implement solutions to the studied problems with a special focus on the effective use of existing tools.		
BI-VMM Selected Mathematical Methods	Z,ZK	4
The lecture begins with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then	1	eries and their
properties. Further, we introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the	e wavelet transform	m. We examine
the linear programming problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples.		
NI-VYC Computability	Z,ZK	4
Classical theory of recursive functions and effective computability.		
BI-ZS10 Bachelor internship abroad for 10 credits	Z	10
Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or	research institutio	on. Before the
internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional		
internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits	-	
employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divide	d into two subjects	s if the internship
exceeds the academic year's dead-line.		00
BI-ZS20 Bachelor internship abroad for 20 credits	Z	20
Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profes		
internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits		
employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divide	-	
exceeds the academic year's dead-line.	· · · · · · · · · · · · · · · · · · ·	• • • •
BI-ZS30 Bachelor internship abroad for 30 credits	Z	30
Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or	1	1
internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional	ssional content and	d extent of the
internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits	s correspond to 4 v	veeks of full-time
employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divide	d into two subjects	s if the internship
exceeds the academic year's dead-line.		
BI-ZIVS Intelligent Embedded System Fundamentals	KZ	4
Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The air		
modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion		
interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to g technologies.	jot practical experi	

BI-ZPI	Process engineering	KZ	4			
Students will learn f	undamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles	of process model	ling and they will			
learn basics of the u	earn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern					
CASE tools. The role	CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of					
an enterprise.						
BI-IOS	Fundamentals of iOS Application Development for iPhone and iPad	KZ	4			
This course is prese	nted in Czech.	•				
BI-ZWU	Introduction to Web and User Interfaces	Z,ZK	4			
This course is prese	nted in Czech.					
BI-3DT.1	3D Printing	KZ	4			

Code of the group: BI-PG-VO.21

Name of the group: Elective vocational Courses for a Bachelor Specialization BI-PG.21, version 2021 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.) Unix Administration	Completion	Credits	Scope	Semester	Role
BI-ADU.21	Zden k Muziká, Petr Zemánek, Miroslav Prágl Zden k Muziká Zden k Muziká (Gar.)	Z,ZK	5	2P+2C	L	V
BI-AWD.21	Web and Database Server Administration Michal Valenta, Lukáš Ba inka Lukáš Ba inka Michal Valenta (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-AG2.21	Algorithms and Graphs 2 Dušan Knop, Michal Opler, Ond ej Suchý, Tomáš Valla, Radek Hušek Ond ej Suchý Ond ej Suchý (Gar.)	Z,ZK	5	2P+2C	L	V
BI-ASB.21	Applied Network Security Yelena Trofimova, Ji í Dostál, Jakub Tetera, Michal Polák, Martin Šutovský, Martin Mandík Ji í Dostál Ji í Dostál (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-APS.21	Architectures of Computer Systems Michal Štepanovský, Pavel Tvrdík Michal Štepanovský Pavel Tvrdík (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-BEK.21	Secure Code Josef Kokeš Josef Kokeš Josef Kokeš (Gar.)	Z,ZK	5	2P+2C	L	V
BI-BIG.21	DB Technologies for Big Data Monika Borkovcová Monika Borkovcová (Gar.)	KZ	5	2P+2C	Z,L	V
BI-EPP.21	Economic Business Processes David Buchtela David Buchtela Tomáš Evan (Gar.)	Z,ZK	5	2P+2C	L,Z	V
BI-FBI.21	Financial Business Intelligence David Buchtela David Buchtela Petra Pavlí ková (Gar.)	Z,ZK	5	2P+2C	Z,L	V
BI-HWB.21	Hardware Security Jií Bu ek Jií Bu ek Jií Bu ek (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-IOT.21	Internet of Things Viktor erný, Lenka Kosková T ísková Lenka Kosková T ísková Lenka Kosková T ísková (Gar.)	Z,ZK	5	2P+2C	z	V
BI-JPO.21	Computer Units Pavel Kubalík Pavel Kubalík Pavel Kubalík (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-KOM.21	Conceptual Modelling Robert Pergl, Marek B lohoubek Robert Pergl Robert Pergl (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-LOG.21	Mathematical Logic Kate ina Trlifajová Kate ina Trlifajová Kate ina Trlifajová (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-MPP.21	Methods of interfacing peripheral devices Miroslav Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-MDF.21	Modern Data Formats Petr Pauš Petr Pauš (Gar.)	KZ	3	1P+1C	Z	V
FIT-ITI	Modern IT infrastructure Ivan Šime ek	Z,ZK	5	2P+1C	Z,L	V
BI-OOP.21	Object-Oriented Programming Filip K ikava, Petr Máj, Filip íha Filip K ikava Filip K ikava (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-PRS.21	Practical Statistics Kamil Dedecius, Petr Novák Petr Novák (Gar.)	KZ	5	1P+2C	L	V
BI-PNO.21	Practical Digital Design Martin Novotný Martin Novotný Martin Novotný (Gar.)	KZ	5	2P+2C	Z	V
BI-PAI.21	Law and Informatics Zden k Ku era, Št pánka Havlíková, Dominik Vítek, Martin Samek, Ji í Maršál, Michal Mat jka Št pánka Havlíková Zden k Ku era (Gar.)	ZK	5	2P+2C	L	V
BI-PJP.21	Programming Languages and Compilers Jan Janoušek, Tomáš Pecka Jan Janoušek (Gar.)	Z,ZK	5	2P+1C	L	V
BI-PPA.21	Programming Paradigms Jan Janoušek, Tomáš Pecka, Petr Máj, Tomáš Jakl Jan Janoušek Jan Janoušek (Gar.)	Z,ZK	5	2P+2R	z	V

BI-PJS.21	JavaScript Programming Martin Kolárik, Nikita Mironov Monika Borkovcová Monika Borkovcová (Gar.)	KZ	5	3C	L	V
BI-PRR.21	Project management David Pešek David Pešek Petra Pavlí ková (Gar.)	Z,ZK	5	2P+2C	Z,L	V
BI-SIP.21	Network Programming Jan Fest Jan Fest Jan Fest (Gar.)	Z	5	2P+2C	Z	V
BI-SP1.21	Team Software Project 1 Michal Valenta, Ji í Chludil, Ji í Mlejnek, Ji í Hunka, Zden k Rybola, Ji í Borský, Jan Matoušek, Radek Richtr, Marek Suchánek, Zden k Rybola Ji í Mlejnek (Gar.)	KZ	5	2C	L	V
BI-SP2.21	Team Software Project 2 Stanislav Kuznetsov, Michal Valenta, Ji í Chludil, Ji í Mlejnek, Ji í Hunka, Zden k Rybola, Ji í Borský, Jan Matoušek, Radek Richtr, Ji í Mlejnek Ji í Mlejnek (Gar.)	KZ	5	2C	Z	V
BI-SPS.21	Administration of Computer Networks and Services Jan Kubr, Libor Dostálek Pavel Tvrdík Libor Dostálek (Gar.)	Z,ZK	5	2P+2S	Z	V
BI-ML1.21	Machine Learning 1 Karel Klouda, Daniel Vašata Daniel Vašata (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-ML2.21	Machine Learning 2 Daniel Vašata Daniel Vašata (Gar.)	Z,ZK	5	2P+2C	L	V
BI-SVZ.21	Machine vision and image processing Marcel Ji ina, Jakub Novák, David Kramný, Justýna Frommová Jakub Novák Marcel Ji ina (Gar.)	Z,ZK	5	2P+2C	L,Z	v
BI-SRC.21	Real-time systems Hana Kubátová, Ji í Vysko il Jaroslav Borecký Hana Kubátová (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-TAB.21	Applications of Security in Technology Ji í Dostál, Jan B Iohoubek, Martin Kolárik, Martin Pozd na Ji í Dostál Ji í Dostál (Gar.)	Z,ZK	5	2P+2C	L	V
BI-TJV.21	Java Technology Stanislav Kuznetsov, Jan Blizni enko, Ji í Dan ek, Raian Samerkhanov Ji í Dan ek	Z,ZK	5	2P+2C	Z	V
BI-TPS.21	Computer Networks Technologies Vladimír Smotlacha, Josef Koumar Vladimír Smotlacha Vladimír Smotlacha (Gar.)	Z,ZK	5	2P+2S	Z	V
BI-TIS.21	Information Systems Pavel Náplava Pavel Náplava (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-TWA.21	Design of Web Applications David Bernhauer David Bernhauer (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-IDO.21	Introduction to DevOps Michal Valenta, Ji í Mlejnek, Tomáš Vondra, Zden k Rybola Tomáš Vondra Ji í Mlejnek (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-UKB.21	Introduction to Cybersecurity Ivana Trummová, Jan B lohoubek, David Pokorný, Jakub Tetera, František Ková , Martin Mandík, Tomáš Lu ák David Pokorný Jan B lohoubek (Gar.)	Z,ZK	5	3P+1C	Z	V
BI-VES.21	Embedded Systems Miroslav Skrbek Miroslav Skrbek (Gar.)	Z,ZK	5	2P+2C	L	V
BI-VDC.21	Virtualization and Data Centers Ji í Kašpar Ji í Kašpar Ji í Kašpar (Gar.)	Z,ZK	5	2P+2C	L	V
BI-VIZ.21	Data Visualization Magda Friedjungová Magda Friedjungová Magda Friedjungová (Gar.)	KZ	5	3P	Z	V
BI-VPS.21	Selected Topics in Computer Networking Alexandru Moucha, Mohamed Bettaz Pavel Tvrdík Mohamed Bettaz (Gar.)	Z,ZK	5	2P+2C	L	V
BI-VWM.21	Searching the Web and Multimedia Databases Ji í Novák, Tomáš Skopal Ji í Novák Tomáš Skopal (Gar.)	Z,ZK	5	2P+1C	L	V
BI-FEM.21	Fundamentals of Economics Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-ZRS.21	Basics of System Control Kate ina Hyniová Kate ina Hyniová Kate ina Hyniová (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-ZSB.21	Basics of System Security Marián Svetlík, Martin Šutovský, Dominik Novák, Ladislav Marko Simona Forn sek Simona Forn sek (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-ZUM.21	Artificial Intelligence Fundamentals Pavel Surynek Pavel Surynek Pavel Surynek (Gar.)	Z,ZK	5	2P+2C	L	v

Characteristics of the courses of this group of Study Plan: Code=BI-PG-VO.21 Name=Elective vocational Courses for a Bachelor Specialization BI-PG.21, version 2021

BI-SP2.21	Team Software Project 2	KZ	5		
Students gain hands-on	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 BIE-SP1 course project				
However, in this follow-u	p, the functionality, testing, and documentation of the software system being developed will be emphasized. Students will we	ork in teams of 4-6	6 people. The		
teacher, in the role of the team and project leader, regularly consults with the team (at the seminars) the formal as well as material aspects of their solution.					
BI-MPP.21	BI-MPP.21 Methods of interfacing peripheral devices Z,ZK 5				
The course is focused on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal serial bus (USB). The course					
includes both PC side and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB devices, Linux and Windows					
drivers, simple application	on development, and APIs of selected devices.				

BI-ADU.21 Unix Administration	Z,ZK	5
Students will learn the internal structure of the UNIX operating system, with the administration of its basic subsystems and with the security principles.		
between user and administrator roles. They will get theoretical and practical knowledge of user management and administration, of users access rig		
processes, memory, network services and remote access, and in the areas of system deployment and virtualization. In the labs, they will verify the specific examples from practice.	knowledge from tr	ne lectures on
BI-AWD.21 Web and Database Server Administration	Z,ZK	5
Students will get acquainted with the administration of database and web servers and services. They will be able to install, configure, operate, test,	1	-
web service systems. The principles will be demonstrated on the PostgreSQL relational database engine and Apache will be used as an example of		
BI-AG2.21 Algorithms and Graphs 2	Z,ZK	5
This course, presented in Czech, introduces basic algorithms and concepts of graph theory as a follow=up on the introduction given in the compuls		
delves into advances data structures and amortized complexity analysis. It also includes a very light introduction to approximation algorithms. For E		
BIE-AG2.21.		
BI-ASB.21 Applied Network Security	Z,ZK	5
The aim of the course is to introduce selected topics from computer networks in terms of cybersecurity. These topics extend the basic knowledge g		
security applications like the public key infrastructure, encrypted network protocols, link and network layer security or wireless networks. After finish	ing the course stu	ident will get
knowledge of security applications in computer networks.	7 71/	
BI-APS.21 Architectures of Computer Systems Students will learn the construction principles of internal architecture of computers with universal processors at the level of machine instructions. Sp		5
pipelined instruction processing and on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the	-	-
not only in scalar processors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness		
program. The course further elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory of	-	
systems.		
BI-BEK.21 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 getti	-	-
theory, students gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not even		
administrator privileges. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securi	-	-
security and database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the	-	5
BI-BIG.21 DB Technologies for Big Data Students will be introduced into the field of Big Data processing where nonrelational (NoSQL) database engines are typically used today. The course	KZ	-
finishing the course students were able to choose suitable tools (mostly open source) and techniques, design and implement a simplest reproducibl		•
collection, transformation/aggregation, presentation). Students get acquainted with various architectures for processing and storing big data. A theo	-	
of individual technologies will be supplemented with specific examples from practice.		
BI-EPP.21 Economic Business Processes	Z,ZK	5
The aim of the course is to present typical processes related to the usual life cycle of a company. The course focuses mainly on the basic economic	and financial asp	ects of business
in the market environment of the Czech Republic and the basics of management. In the course, students are acquainted with the typical phases of		
establishment of the company, through the management of property and capital structure, financing of the company, determining the cost function of	of the company an	id labor costs, to
evaluating the financial health of the company and its eventual rehabilitation or termination.	7 71/	
BI-FBI.21 Financial Business Intelligence	Z,ZK	5
The aim of the course is to acquaint students primarily with financial accounting as a tool for recording business operations and documents for busin and other indicators for comparison with other companies and management decision process at the tactical and strategic level. The second view is		-
for financial management and prediction of business development. Management accounting allows monitoring of the financial status and performance	0	•
accounting periods, enables a multidimensional view of business data, enables to control effectively factors affecting the return on invested capital a		
assess options related to future business decisions. The principles of management accounting, described in this course, are the basis of Business	Intelligence modul	les in business
information systems, decision support systems, and other knowledge-oriented systems.		
BI-HWB.21 Hardware Security	Z,ZK	5
The course deals with hardware resources used to ensure security of computer systems including embedded ones. Students become familiar with the c		
modules, security features of modern processors, and storage media protection through encryption. They will gain knowledge about vulnerabilities of HV		-
attacks and tampering with hardware during manufacture. Students will have an overview of contact and contactless smart card technology includir for multi-factor authentication (biometrics). Students will understand methods of efficient implementations of ciphers.	ig applications and	d related topics
BI-IOT.21 Internet of Things	Z,ZK	5
The course focuses on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an		1
wireless communication technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT arch	nitectures for differ	ent application
areas. Within the computer labs, students will gain practical experience with developing simple IoT systems using common development environme	nts (hardware - A	RM, ESP, STM;
software - Arduino, Raspberry Pi OS).		
BI-JPO.21 Computer Units	Z,ZK	5
Students deepen their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detailed in the obligatory course of the program (BIE-SAP), get acquainted in detailed in the obligatory course of the program (BIE-SAP), get acquainted in detailed in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory course of the program (BIE-SAP), get acquainted in the obligatory cours		
organization of computer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using ap of multiplication. The organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, incl		-
correction for parallel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of co	•	
the environment and the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational mic		-
and programmable hardware design kits (FPGA).		
BI-KOM.21 Conceptual Modelling	Z,ZK	5
The course is focused on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning keeping abstract thinking and precise formulation skills using conceptual models.	y terms in a doma	in, the ability to
categorize and specify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontological s		5
notation. Next, they learn how to express business rules and constraints using the OCL language and foundations of OWL/RDF semantic data repre-		-
learn the foundations of enterprise engineering, being a discipline for conceptual modelling of enterprises and institutes and their processes. The DEI will be taught. The course is designed with the respect to continuation in software implementations. Recommended optional follow-up course: BI-ZF		
BI-LOG.21 Mathematical Logic	Z,ZK	5
The course focuses on the basics of propositional and predicate logic. It starts from the semantic point of view. Based on the notion of truth, satisfia		1
logical consequence of formulas are defined. Methods for determining the satisfiability of formulas, some of which are used for automated proving,		
vs. NP problem and Boolean functions in propositional logic. In predicate logic, the course further deals with formal theories, such as arithmetics, and	•	
approach to mathematical logic is demonstrated on the axiomatic system of propositional logic and its properties. Gödel's incompleteness theorem	s is explained.	

BI-MDF.21	Modern Data Formats	KZ	3
The goal of the course	is to give an overview of commonly used data formats for typical types of data. There will be a description of each data type a	and the data forma	ats used for that
data type along with too	ols available to work with such data. After finishing the course, the students should know how to work with common data, e.g.	on the Web.	
FIT-ITI	Modern IT infrastructure	Z,ZK	5
BI-OOP.21	Object-Oriented Programming	Z,ZK	5
Object-oriented prograr	mming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate togeth	er by message pa	issing. In this
course students get acc	uainted with the main principles of object-oriented programming and design, used in modern programming languages. The er	mphasis is on prac	ctical techniques
for developing software	which includes testing, error handing, refactoring, and application of design pattern.		
BI-PRS.21	Practical Statistics	KZ	5
The students will be intr	, oduced to methods of applied statistics. They will learn how to work with various types of data, perform analyses, and choose	models fitting the	data. The course
	ion and correlation analysis, analysis of variance and non-parametric methods. Students will learn to use the statistical softw	are R and will app	bly the studied
methods on data from r	eal problems.		
BI-PNO.21	Practical Digital Design	KZ	5
Students get an overvie	w of the contemporary digital design flow and learn practical skills to use synchronous design techniques. They understand t	the basics of the V	HDL language
-	hnologies FPGA and ASIC. Students demonstrate practical use of the design techniques in the course project using modern	industry-standard	I CAD design
tools.			
BI-PAI.21	Law and Informatics	ZK	5
	s to introduce students into the basic legal instruments that they will encounter in their practice. Students will gain knowledge	-	
	rted to the pitfalls that await them in business from the point of view of law. They will understand the process of concluding ca		
	their responsibilities in working with the Internet, will be familiar with the institutes of intellectual property law, and will be able		
	es. Emphasis will also be put on the legal protection of data on the Internet, the registration of Internet domains and protection	-	
	uch behaviour in the field of IT that can be classified as criminal under the Czech law. The course will also include analyses of		
BI-PJP.21	Programming Languages and Compilers	Z,ZK	5
	mpiling methods of programming languages. They are introduced to intermediate representations used in current compilers		-
	f a translation of a text that conforms a given syntax, to a target code and also to create a compiler based on the specification	1. The compiler ca	in translate not
, , , , ,	guage but any text in a language generated by a given LL input grammar.		
BI-PPA.21	Programming Paradigms	Z,ZK	5
	asic paradigms of high-level programming languages, including their basic execution models, benefits, and disadvantages of		
	and its basic principles are explained in details. Logic programming is introduced as another way of declarative programming		
	I on Lisp (Racket) and Prolog programming languages. Moreover, usage of these principles is demonstrated on modern mair	stream programm	ning languages
such as C++ and Java.			
BI-PJS.21	JavaScript Programming	KZ	5
The course is an introd	uction to Javascript programming. Students will also learn best practices and get acquai nted with tools that make code devel	opment in Javasc	ript easier.
BI-PRR.21	Project management	Z,ZK	5
	s to introduce students into the basic concepts and principles of project management, i.e. methods of planning, teamwork, ar	-	-
	, argumentation and meeting management. Students will practice project management techniques (e.g. SWOT analysis, risk		-
	schedule, resource balancing, network graphs) and creation of project documentation. The course is designed especially for		
	dge outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in I	arge companies.	The course is
	e who will develop software or hardware in the form of team projects.		_
BI-SIP.21	Network Programming	Z	5
	amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level prog		
	to designing communication protocols and their verification. The third part introduces the principles and applications of middl	-	
	n models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in co	omputer labs using	g a chosen
programming language			_
BI-SP1.21	Team Software Project 1	KZ	5
-	experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the		
-	aches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The te		
	consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software	artefact will be fu	rther developed
and finished in the BIE-			_
BI-SPS.21	Administration of Computer Networks and Services	Z,ZK	5
	s to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administr	-	
	e course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained	I by practical hand	ls-on experience
with real network infras		7 71	-
BI-ML1.21	Machine Learning 1	Z,ZK	5
-	is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working l		
	the supervised learning scenario and clustering models in the unsupervised scenario. Students will be aware of the relations	-	
	fundamentals of assessing model quality. Moreover, they learn the basic techniques of data preprocessing and multidimension	onal data visualiza	ation. In practical
	s and scikit libraries in Python will be used.	7 71	-
BI-ML2.21	Machine Learning 2	Z,ZK	5
-	is to introduce students to the selected advanced methods of machine learning. In the supervised learning scenario, they, in	-	
	the unsupervised learning scenario students learn the principal component analysis and other dimensionality reduction met prcement learning and natural language processing.	nous. Moreover, s	ludents get the
		7 71	-
BI-SVZ.21	Machine vision and image processing	Z,ZK	5
-	ecoming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluat	-	
	lifferent types of camera systems and a variety of methods for image and video processing. The course is focused on practical at the graduates may encounter	use or camera sys	sterns for solving
	at the graduates may encounter.	7 71/	F
BI-SRC.21	Real-time systems	Z,ZK	5 ovvlada a from
	sic knowledge in the real-time (RT) system theory and in the design methods for RT systems including the dependability issue		-
	entally verified in computer labs. The course is mainly focused on embedded RT systems, therefore the design kits in the lab	are the same as	III UIE BIE-VES
Course.	Applications of Coordinate Technology	7 71/	-
BI-TAB.21	Applications of Security in Technology	Z,ZK	5
-	is to introduce students to selected topics from cybersecurity technical applications that are utilized in different industries. Stu	idents get a broad	ier overview of
cybersecurity application	ns and extend their knowledge from the cryptology, the secure code, and system, network, and hardware security.		

DLT N/24	7 71/	<i>r</i>
BI-TJV.21 Java Technology	Z,ZK	5
The goal is to provide knowledge and skills for developing information systems and applications through concepts used in software development and	experience with lit	praries and tools
from Java language ecosystem. At the course end, the students are able to develop software systems in Java platform.		
BI-TPS.21 Computer Networks Technologies	Z,ZK	5
The course introduces students with basic and advanced technologies, components, and interfaces of contemporary computer networks at the phys	ical layer with the	overlap to the
link layer. The lectures provide theoretical foundations of these technologies and explain relevant physical principles. In the labs, the respective technologies and explain relevant physical principles in the labs, the respective technologies are explained as the respective technologies ar	-	-
with the most important ones students will get hands-on experience. Thematically, the course covers both local and long-range optical networks, Eth	-	
always with focus on high-speed networks.		elecci lictifelile,
	7 71/	~ ~
BI-TIS.21 Information Systems	Z,ZK	5
The goal of this course is to familiarise students with the information systems topic and information systems implementation principles. During the co		
"on the market" existing types of systems and their usage in specific industry segments. Students are familiarised with the CRM, ERP, MRP and other		-
The fundamental part of the course is the introduction to key ideas of an information system selection, evaluation of information system benefits, wa	ys of information s	systems
implementation and information system implementation based on the project management principles. The emphasis is on the initial customer analys	is, customer insig	ht and ability to
decide whether it is better to implement any existing information system or to develop a new one from scratch. These factors determine the information	n system impleme	ntation success.
At the end of the course information systems security, operation, support, maintenance, legislation impacts, and government information systems to	pics are discusse [,]	d.
BI-TWA.21 Design of Web Applications	Z.ZK	5
	ı ' I	-
The basic course of web application development. Initially, the students become familiar with HTTP and its possibilities and partly with some propert		-
structure (HTML) and presentation of document on the Web (CSS). These skills provide the necessary basis for the development of Web application		
modern libraries facilitate the development of Web pages applications. Server side will be demonstrated on PHP technology using frameworks Symf	ony 2, Doctrine 2.	Developments
on the client side will be demonstrated using a JavaScript language with library jQuery and possibly MV* framework React.		
BI-IDO.21 Introduction to DevOps	Z,ZK	5
The course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of	· · ·	ices. The course
covers the tools to support software development, testing and compilation. It also focuses on tools for automating infrastructure management and bu	-	
the Cloud. It is an introduction to technologies that will then be discussed in more detail in related follow-up courses. The student will also get acquai	• • • •	•
	nieu with modern	technologies
used in practice.		
BI-UKB.21 Introduction to Cybersecurity	Z,ZK	5
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 c	verview of threats	in cyberspace
and attacker techniques, security mechanisms in networks, operating systems and applications, as well as of basic cyberspace regulations.		
BI-VES.21 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 emb	I ' I	-
	50000 processors	, then integrated
peripheral circuits, programming methods, and applications. They get practical skills with development kits and tools.		
BI-VDC.21 Virtualization and Data Centers	Z,ZK	5
The aim of the course is to familiarize students with technology basis of cloud computer systems. It shows principles and techniques used in design a	and implementation	on of data center
infrastructure, such as various kinds of virtualization and high availability of servers, storages, and software layers. The course guides through data d	enter technologie	es from private
to public and hybrid clouds. Student learn current trends in the architecture of IT infrastructure and its configuration for classic and cloud applications	3. Students will un	derstand the
design, validation, and operation of complex infrastructures for modern applications with respect to scalability and protection against overloads, outa		
BI-VIZ.21 Data Visualization	KZ	5
	I I	-
The course offers an overview of the types and characteristics of data as well as suitable visualization methods. This will aid the students in understa	•	
application in areas such as data mining and machine learning. Within the course, students will be introduced to exploratory data analysis, preproce		-
different kinds of data such as text, social networks, time series or basic image data processing. Students will get hands-on experience in applications	of selected method	ods to real-world
examples in the Python programming language.		
BI-VPS.21 Selected Topics in Computer Networking	Z,ZK	5
The course builds upon the Computer Networks course (BI-PSI), obligatory for the program. Students will learn in detail principles, protocols, and tech		-
networks from local area networks up to Internet, with focus on switching, routing, security, and virtualization. The emphasis will be on gaining practi		
	•	Inteditietwork
devices in the lab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, and securit		
BI-VWM.21 Searching the Web and Multimedia Databases	Z,ZK	5
Students get basic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous stora	ge of documents.	In particular,
students acquire information about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from	n web pages. The	ey get detailed
knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web	search engines fo	or the mentioned
data types (documents).		
BI-FEM.21 Fundamentals of Economics	Z,ZK	5
	· · ·	
The course allows the students to discover basics of economic theory, which will then be used in subsequent courses of economics and manageme	nt. It contains a ge	eneral overview
of fundamental microeconomic and macroeconomic topics.		
BI-ZRS.21 Basics of System Control	Z,ZK	5
The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will for	cus our attention p	articularly on
control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, descript		
basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of cr	eating a descripti	on of the system
model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also give		
control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industri		
		. 5. 5511110005
and digital controllers and PLC control.		
BI-ZSB.21 Basics of System Security	Z,ZK	5
The goal of the course is to provide introduction to basic concepts in security of computer systems. Further, the course introduces the basics of fore	nsic 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 mod	dern operating sys	stems security,
as well as skills needed for independent work in the area of operating system security incident analysis.		
BI-ZUM.21 Artificial Intelligence Fundamentals		
	7 7K	5
	Z,ZK	5 ill be discussed
Basic course on introduction to artificial intelligence with emphasis on symbolic techniques. The design of an intelligent agent and the techniques needed	eded to create it w	ill be discussed,
	eded to create it w o by a non-physic	ill be discussed,

List of courses of this pass:

Code	Name of the course	Completion	Credits
BI-3DT.1	3D Printing	KZ	4
BI-A2L	English language, preparation for the B2 level exam	Z	2
The content of the	course corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement	- students are due	to: -Take an
	anguage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both the		
tests with the succe	ess rate set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by ind	ividual teachers du	ring the firs
	class of the term.		
BI-AAG.21	Automata and Grammars	Z,ZK	5
	uced to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite	-	-
	ars, context-free grammars, construction and use of pushdown automata, and translation grammars and transducers. They know the		
	ey understand the relationships between formal languages and automata. They are introduced to the Turing machine and complexity		
BI-ACM	Programming Practices 1	KZ	5
	This is a selective course for preparing talented student for representation in international programming contests.	1/7	
BI-ACM2	Programming Practices 2	KZ	5
	This is a selective course for preparing talented student for representation in international programming contests.	1/7	
BI-ACM3	Programming Practices 3	KZ	5
	This is a selective course for preparing talented student for representation in international programming contests.	1/7	
BI-ACM4	Programming Practices 4	KZ	5
	This is a selective course for preparing talented student for representation in international programming contests.	7 71/	5
BI-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	Z,ZK	-
	administrator roles. They will get theoretical and practical knowledge of user management and administration, of users access rights,		
	ry, network services and remote access, and in the areas of system deployment and virtualization. In the labs, they will verify the kn		
F,	specific examples from practice.		
BI-ADW.1	Windows Administration	Z,ZK	4
	This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).] _,	1 -
BI-AG1.21	Algorithms and Graphs 1	Z,ZK	5
	is the basics of efficient algorithm design, data structures, and graph theory, belonging to the core knowledge of every computing cu	1 1	d partially
	ledge from the course BI-DML.21, in which students acquire the knowledge and skills in combinatorics necessary for evaluating the		
algo	rithms. The course also follows up knowledge from BI-MA1.21, the practical usage of asymptotic mathematics, in particular, the asyr	nptotic notation.	
BI-AG2.21	Algorithms and Graphs 2	Z,ZK	5
This course, pres	ented in Czech, introduces basic algorithms and concepts of graph theory as a follow=up on the introduction given in the compulsory	y course BI-AG1.2	1. It further
delves into advan	ces data structures and amortized complexity analysis. It also includes a very light introduction to approximation algorithms. For Eng	lish version of the o	course see
	BIE-AG2.21.		
BI-ALO	Algebra and Logic	Z,ZK	4
	The course extends and deepens the study of topics touched upon in the basic course in logic.		
BI-AND.21	Programming for the Android Operating System	KZ	4
	This course is presented in Czech.		
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	G	
BI-ANG1	English Language Examination without Preparatory Courses	Z,ZK	2
BI-ANGK	English language, contact preparation for the B2 level exam	Z	2
The content of the	course corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement	- students are due	to: -Take ar
active part in the	anguage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both the	ne midterm and the	e final term
tests with the succe	ess rate set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by ind	ividual teachers du	ring the firs
	class of the term.		T
BI-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. Spec		
	n processing and on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the prin	-	-
-	processors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness of	-	
program. The cours	e further elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory cohe	rence and consiste	ency in such
	systems.	L/7	4
BI-ARD	Interactive applications on Arduino	KZ	4
	ned for students of first grade of bachelor study as introduction to embedded systems. Students will learn how to design simple application of available libraries. The goal of the subject is to show varied software approaches to control embedded systems.		-
	ried peripherals with help of available libraries. The goal of the subject is to show varied software approaches to control embedded s y of a PC. Thanks to possible control on higher (objective) layer, this platform is frequently used for artist performance and therefore	-	
	Software Engineering students.	Sultable even IU	
BI-ASB.21	Applied Network Security	Z,ZK	5
	rse is to introduce selected topics from computer networks in terms of cybersecurity. These topics extend the basic knowledge gaine		1
	ons like the public key infrastructure, encrypted network protocols, link and network layer security or wireless networks. After finishin		
	knowledge of security applications in computer networks.		301

BI-AVI.21	Algorithms visually	Z,ZK	4
The course comple	ments other algorithm courses at FIT. It brings knowledge about particular important algorithms from different fields of the computer so	cience that extend s	substantially
knowledge presente	ed in BI-AG1 and BI-AG2. A wide scope of covered subject is made possible due to using visualization bz Algovision (www.algovision.org& that make understanding the principles of algorithms easy.	lt;http://www.algovis	sion.org>)
BI-AWD.21	Web and Database Server Administration	Z,ZK	5
Students will get ac	quainted with the administration of database and web servers and services. They will be able to install, configure, operate, test, and	backup complex da	atabase and
web servi	ice systems. The principles will be demonstrated on the PostgreSQL relational database engine and Apache will be used as an exar	nple of a web serve	er.
BI-BAP.21	Bachelor Thesis	Z	14
BI-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 fa		-
-	gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every		
	leges. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securing		
-	database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the		
BI-BIG.21	DB Technologies for Big Data oduced into the field of Big Data processing where nonrelational (NoSQL) database engines are typically used today. The course is f	KZ KZ	5
	e students were able to choose suitable tools (mostly open source) and techniques, design and implement a simplest reproducible m		
	nation/aggregation, presentation). Students get acquainted with various architectures for processing and storing big data. A theoretic		
	of individual technologies will be supplemented with specific examples from practice.		
BI-BLE	Blender	Z,ZK	4
The course extend	ds knowledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those i	nterested in 3D gra	aphics and
animation. It o	ffers a complete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming grap	hics applications) c	ourse.
BI-BPR.21	Bachelor project	Z	1
. .	g of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the	•	
	semester to process the assignment. If he completes these tasks, the supervisor will award him a credit from the subject BI-BPR at the start of the second start of the first the second start of the second s		
	enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvu 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 to		· /
	nulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assi		
	can be supplemented and approved at the end of the semester.	g	Jeengraam
BI-CCN	Compiler Construction	Z,ZK	5
	ictory class on compiler construction for bachelor students in computer science. The goal of the class is to introduce basic principles		
understa	nd the design and implementation of programming languages. Seeing and actually understanding self-compilation is the overarching	theme of the class	s.
BI-CS1	Programming in C#	KZ	4
The goal of the cou	arse is to introduce .NET Framework as a multi-language development platform. Then, programming language C#, its fundamental co	onstruction, types o	of variables,
	s, loops, definitions and calls of functions will be discussed. Attention is focused on the object oriented programming in C# - class definitions and calls of functions will be discussed.		
constructors, method	ods, properties, static members, Garbage Collector, inheritance and polymorphism, collections, delegates, and generics. Debugging	and exception pro	cessing, as
	well as work with files are emphasized.		
		1/7	4
BI-CS2	C# language and data access	KZ	4
The C# language	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros	soft platform. The si	tudents will
The C# language a get to know object	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech	soft platform. The sinned and the second sec	tudents will INQ - a set
The C# language a get to know objects of features for que	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros	soft platform. The si nologies such as L INQ to Objects, Ll	tudents will INQ - a set NQ to XML
The C# language a get to know objects of features for quer and LINQ to SQL)	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I	soft platform. The si nologies such as L INQ to Objects, Ll using domain-speci	tudents will INQ - a set NQ to XML ific objects
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to it the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description).	soft platform. The si nologies such as L INQ to Objects, Ll using domain-speci I, Storage Model ar	tudents will INQ - a set NQ to XML ific objects nd Mapping
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications	soft platform. The s nologies such as L .INQ to Objects, Ll using domain-speci I, Storage Model ar KZ	tudents will INQ - a set NQ to XML ific objects nd Mapping 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I b. Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview	soft platform. The s nologies such as L .INQ to Objects, Ll using domain-speci I, Storage Model ar KZ	tudents will INQ - a set NQ to XML ific objects nd Mapping 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs.	off platform. The sinologies such as L INQ to Objects, Ll using domain-speci I, Storage Model ar KZ of the development	udents will INQ - a set NQ to XML ffic objects nd Mapping 4 possibilities
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems	off platform. The sinologies such as L INQ to Objects, Ll using domain-speci I, Storage Model an KZ of the development Z,ZK	udents will INQ - a set NQ to XML ffic objects and Mapping 4 possibilities 5
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model an KZ of the development Z,ZK n to design small d	udents will INQ - a set NQ to XML Ific objects and Mapping 4 possibilities 5 latabases
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model an KZ of the development Z,ZK n to design small d SQL language, as	udents will INQ - a set NQ to XML Ific objects and Mapping 4 possibilities 5 latabases well as with
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of	tudents will INQ - a set NQ to XML ffic objects and Mapping 4 possibilities 5 latabases well as with f transaction
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They understand the fundation - the relational database model. They learn the principles of normalizing a relational database schema. They understand the fundation - the relational database model. They learn the principles of normalizing a relational database schema.	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as Imental concepts of to special ways of s	4 possibilities 5 latabases well as with f transaction storing data
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They understand the funda tion - the relational database model. They learn the principles of normalizing a relational database schema. They understand the funda ling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced optimizing database applications, distributed database systems, data stores.	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of si base systems, deb	4 possibilities 5 latabases well as with f transaction storing data ugging and
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They understand the funda tion - the relational database model. They learn the principles of normalizing a relational database schema. They understand the funda ling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administratio	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as Imental concepts of to special ways of s	4 possibilities 5 latabases well as with f transaction storing data
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databat BI-DML.21 Students will get ac	C# language and data access and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I b. Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to it the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Database engine architecture and typical user roles. They are briefly introduced to various database models. They learn to the relational database model. They learn the principles of normalizing a relational database schema. They understand the funda ling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced asse with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database systems, data stores. Discrete Mathematics and Logic aquainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model ar KZ of the development Z,ZK In to design small d SQL language, as amental concepts of to special ways of s base systems, deb	udents will INQ - a set NQ to XML fric objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained.
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databat BI-DML.21 Students will get ac	C# language and data access and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I b. Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model ar KZ of the development Z,ZK In to design small d SQL language, as amental concepts of to special ways of s base systems, deb	udents will INQ - a set NQ to XML fric objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained.
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databat BI-DML.21 Students will get ac Special attention is	C# language and data access and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I b. Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of si base systems, deb Z,ZK m set theory will base also lays down th	tudents will INQ - a set NQ to XML fic objects and Mapping 4 possibilities 5 databases well as with f transaction storing data ugging and 5 e explained. he basics of
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databat BI-DML.21 Students will get ac	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to it the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Duduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn to near roles to a single data source, as well as recovering a database engine from a failure. They are briefly introduced in gatabase application of data. Discrete Mathematics and Logic requainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History	soft platform. The sinologies such as L INQ to Objects, LI Ising domain-speci I, Storage Model ar KZ of the development Z,ZK In to design small d SQL language, as amental concepts of to special ways of s base systems, deb	udents will INQ - a set NQ to XML ffic objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained.
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databat BI-DML.21 Students will get ac Special attention is BI-EHD	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to is the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They are briefly introduced asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database systems, data stores. Discrete Mathematics and Logic requainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of sibase systems, deb Z,ZK m set theory will be se also lays down the Z,ZK	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 tatabases well as with f transaction storing data ugging and 5 e explained. he basics of 3
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EJK	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I b. Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the ation - the relational database model. They lear the principles of normalizing a relational database schema. They understand the funda ling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database systems, data stores. Discrete Mathematics and Logic curve combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Enterprise Java and Kotlin	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as umental concepts of to special ways of sibase systems, deb Z,ZK m set theory will be see also lays down th Z,ZK	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EJK	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to is the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They are briefly introduced asses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database systems, data stores. Discrete Mathematics and Logic requainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as umental concepts of to special ways of sibase systems, deb Z,ZK m set theory will be see also lays down th Z,ZK	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EJK The course is on ac	C# language and data access and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET.Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (1 b. Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data of (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems duced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn the principles of normalizing a relational database schema. They understand the funda ting parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced uptimizing database applications, distributed database systems, data stores. Discrete Mathematics and Logic uptimizing database application logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Enterprise Java and Kotlin evanced technologies in the Java and Kotlin programming languages. The focus is on technologies for developing enterprise informa architecture, that can be deployed to the cloud.	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as umental concepts of to special ways of sibase systems, deb Z,ZK m set theory will be see also lays down th Z,ZK tion systems with n	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EJK	C# language and data access and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET.Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (1 Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data (the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn the principles of normalizing a relational database schema. They understand the funde ting arallel user access to a single data source, as well as recovering a database engine form a failure. They are briefly introduced apptinzing database applications, distributed database systems, data stores. Discrete Mathematics and Logic uptimizing database applications, distributed database systems, and partial orders. The course combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Enterprise Java and Kotlin	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as umental concepts of to special ways of sibase systems, deb Z,ZK m set theory will be see also lays down th Z,ZK	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EJK The course is on ac	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (1 b, Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data to it the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Dduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn constraints) using a conceptual model and implement them in a relational database engine. They are briefly introduced uses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database systems, data storce. In part of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Enterprise Java and Kotlin programming languages. The focus is on technologies for developing enterprise informa	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as umental concepts of to special ways of sibase systems, deb Z,ZK m set theory will be see also lays down th Z,ZK tion systems with n	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational database BI-DML.21 Students will get ac Special attention is BI-EHD BI-EHD BI-EJK The course is on ac BI-EP1.24	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (1 b, Another objective is the Entity Framework - an object-relational mapper that enablesNET developers to work with relational data i t the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Ducued to the database engine architecture and typical user roles. They are briefly introduced to various database models. They learn constraints) using a conceptual model and implement them in a relational database engine. They are briefly introduced uses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database application, distributed database systems, data stores. Discrete Mathematics and Logic squainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Effective programming 1 The course is taught in Czech.	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of sis base systems, deb Z,ZK m set theory will be se also lays down th Z,ZK tion systems with n KZ	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational database BI-DML.21 Students will get ac Special attention is BI-EHD BI-EHD BI-EJK The course is on ac BI-EP1.24	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micros s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech ying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I Another objective is the Entity Framework - an object-relational mapper that enables. NET developers to work with relational data to t the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mode (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. On thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Dduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the ation - the relational database model. They learn the principles of normalizing a relational database schema. They understand the funde ling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced Discrete Mathematics and Logic squainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of sis base systems, deb Z,ZK m set theory will be se also lays down th Z,ZK tion systems with n KZ	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational database BI-DML.21 Students will get ac Special attention is BI-EHD BI-EHD BI-EJK The course is on ac BI-EP1.24	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micror ying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (I). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data (soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of sis base systems, deb Z,ZK m set theory will be se also lays down th Z,ZK tion systems with n KZ	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice 4
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EHD BI-EHD BI-EHD BI-EP1.24 BI-EP2 Continuation of Eff BI-EPP.21 The aim of the cour	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micror s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech ying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (), Another objective is the Entity Framework - an object-relational mapper that enables. NET developers to work with relational data a (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. On thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Dudued to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the isses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database engine from a failure. They are briefly introduced uses with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial order. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Effective programming 1 The course is to ead and woy of solving indivi with the aim to choose the best one and avoid implementation errors. Effective pro	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as mental concepts of to special ways of s base systems, deb Z,ZK m set theory will be se also lays down th Z,ZK tion systems with n KZ dual problems are Z,ZK	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice 4 4 discussed, 5 of business
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EHD BI-EHD BI-EHD BI-EP1.24 BI-EP2 Continuation of Eff BI-EPP.21 The aim of the cour in the market envir	C# language and data access and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micror s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech ying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (). Another objective is the Entity Framework - an object-relational mapper that enables. NET developers to work with relational data i the course introduces Code First, Database First, Model First approaches. The students will acquire a comprehensive overview. (ML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. on thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the aion - the relational database model. They learn the principles of normalizing a relational database cover: Administration of data optimizing data source, as well as recovering a database engine. They are briefly introduced is parefered with the basic concepts of propositional logic and predicate logic and learn to vore: Administration of data optimizing database applications, distributed database systems, database, and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Enterprise Java and Kotlin Czech. However, that an be deploye	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of s base systems, deb Z,ZK m set theory will be se also lays down th Z,ZK tion systems with n KZ dual problems are Z,ZK dual problems are	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice 4 5 of business le, from the
The C# language a get to know object of features for quer and LINQ to SQL) (ORM). This part of BI-CS3 The students will be BI-DBS.21 Students are intro (including integrity of its theoretical found processing, control in relational databa BI-DML.21 Students will get ac Special attention is BI-EHD BI-EHD BI-EHD BI-EHD BI-EP1.24 BI-EP2 Continuation of Eff BI-EPP.21 The aim of the cour in the market envir	C# language and data access and data access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Micror s used to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current tech ying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (), Another objective is the Entity Framework - an object-relational mapper that enables. NET developers to work with relational data a (XML description). Language C# - design of web applications introduced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overview. On thisplatform. They will learn to create WebAPI and to use it by client programs. Database Systems Dudued to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the isses with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of data optimizing database applications, distributed database engine from a failure. They are briefly introduced uses with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial order. The cours combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753). Efficient Programming 1 The course is regramming 1 ficient Programming 1. Students will practice implementation of algorithms by solving typical problems. Various ways of solving indivi with the aim to	soft platform. The sinologies such as L INQ to Objects, LI using domain-speci I, Storage Model ar KZ of the development Z,ZK n to design small d SQL language, as imental concepts of to special ways of s base systems, deb Z,ZK m set theory will be se also lays down th Z,ZK tion systems with n KZ dual problems are Z,ZK dual problems are	tudents will INQ - a set NQ to XML ific objects and Mapping 4 possibilities 5 latabases well as with f transaction storing data ugging and 5 e explained. he basics of 3 4 nicroservice 4 5 of business le, from the

BI-FBI.21	Financial Business Intelligence	Z,ZK	5
	rse is to acquaint students primarily with financial accounting as a tool for recording business operations and documents for business	-	-
	s for comparison with other companies and management decision process at the tactical and strategic level. The second view is man	-	-
-	ement and prediction of business development. Management accounting allows monitoring of the financial status and performance of t		
	ds, enables a multidimensional view of business data, enables to control effectively factors affecting the return on invested capital and lated to future business decisions. The principles of management accounting, described in this course, are the basis of Business Inte		
	information systems, decision support systems, and other knowledge-oriented systems.	ligence modules i	
BI-FEM.21	Fundamentals of Economics	Z,ZK	5
	the students to discover basics of economic theory, which will then be used in subsequent courses of economics and management.		1
	of fundamental microeconomic and macroeconomic topics.	<u>.</u>	
BI-GIT.21	SW Development Technologies	Z	3
	ed at one of the rudimental team software development technology - version control. To be more specific, we will introduce students to	Git, the informati	ion manager
	from hell, as Linus Torvalds nicknamed it, and provide a comprehensive guide into its depths, as well as for day-to-day use		
BI-HAM	HW accelerated network traffic monitoring	KZ	4
	duces students to modern and widely used technologies and principles in the area of network infrastructure and traffic monitoring. Th	-	-
	mandatory skills to network operators (planning and development of resources and infrastructure) and security analysts alike (as a s		
for analysis). The g	oals of the course are to acquaint students with the modern trends and cornerstone principles in the area of monitoring network traffi	c on a nardware a	and software
	level and to develop their practical abilities in this field.	7 74	F
BI-HAS	Human Aspects in Cryptography and Security students interested not only in technical scope of computer science, but also in making products usable - for users and for developers	Z,ZK	
	use their gained knowledge to design, plan and analyse their own projects in the context of human-centered security.	S. Olddenis of this	
BI-HMI	History of Mathematics and Informatics	Z,ZK	3
2	This course is presented in Czech.		
BI-HWB.21	Hardware Security	Z,ZK	5
	ith hardware resources used to ensure security of computer systems including embedded ones. Students become familiar with the opera		-
modules, security fe	eatures of modern processors, and storage media protection through encryption. They will gain knowledge about vulnerabilities of HW res	ources, including	side-channel
attacks and tampe	ering with hardware during manufacture. Students will have an overview of contact and contactless smart card technology including a	pplications and rel	lated topics
	for multi-factor authentication (biometrics). Students will understand methods of efficient implementations of ciphers.		1
BI-IDO.21	Introduction to DevOps	Z,ZK	5
	vith the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of syst		
	support software development, testing and compilation. It also focuses on tools for automating infrastructure management and build		
	introduction to technologies that will then be discussed in more detail in related follow-up courses. The student will also get acquaint used in practice.	ea with modern te	chinologies
BI-IOS	Fundamentals of iOS Application Development for iPhone and iPad	KZ	4
Brico	This course is presented in Czech.	1.2	
BI-IOT.21		Z.ZK	5
BI-IOT.21 The course focuses	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over	Z,ZK view of sensors ar	5 nd actuators,
The course focuses	Internet of Things	view of sensors ar	nd actuators,
The course focuses wireless communi	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments	view of sensors ar ctures for different	nd actuators, application
The course focuses wireless communi areas. Within the c	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS).	view of sensors ar ctures for different (hardware - ARM,	nd actuators, application , ESP, STM;
The course focuses wireless communi areas. Within the c BI-JPO.21	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units	view of sensors ar ctures for different (hardware - ARM, Z,ZK	actuators, application , ESP, STM;
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str	actuators, application , ESP, STM; 5 ructure and
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp	application application , ESP, STM; 5 ructure and plementation
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d	b actuators, application , ESP, STM; 5 ructure and plementation letection and
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro	ad actuators, application , ESP, STM; 5 ructure and plementation letection and ocessor with
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including lel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro	ad actuators, application , ESP, STM; 5 ructure and plementation letection and ocessor with
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including lel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of commo d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro-	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro	ad actuators, application , ESP, STM; 5 ructure and plementation letection and ocessor with
The course focuses wireless communi areas. Within the communi- BI-JPO.21 Students deepen organization of com- of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT archited computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp is organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including data serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic	a actuators, application , ESP, STM; 5 ructure and plementation letection and ocessor with sor simulator 5 c keys and
The course focuses wireless communi areas. Within the communi- BI-JPO.21 Students deepen organization of com of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT archited computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp is organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including det and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to erms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat	a actuators, application , ESP, STM; 5 ructure and polementation letection and ocessor with sor simulator 5 c keys and bs, students
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of com of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v aputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp is organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including det and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to erms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procen	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal	a actuators, application , ESP, STM; 5 ructure and oblementation letection and ocessor with sor simulator 5 c keys and bs, students ysis.
The course focuses wireless communi areas. Within the communi- BI-JPO.21 Students deepen organization of com- of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v aputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp is organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including data serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to erms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procer Conceptual Modelling	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK	a actuators, application , ESP, STM; sructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students ysis. 5
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of com of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including lel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proces Conceptual Modelling used on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t	a actuators, application , ESP, STM; Sructure and oblementation letection and ocessor with sor simulator 5 c keys and bs, students ysis. 5 the ability to
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of com of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architer computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including lel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to erms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proces Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontological struc- city correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontol	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in th	a actuators, application , ESP, STM; Sructure and oblementation letection and ocessor with sor simulator 5 c keys and bs, students ysis. 5 the ability to he OntoUML
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe- notation. Next, they	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including lel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proces Conceptual Modelling used on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in th ation in the Interna	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architect computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v puter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp te organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including del and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of common d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security terstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procee Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontological struct rearn how to express business rules and constraints using the OCL language and foundations of OWL/RDF semantic data represent	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in the ation in the Interna- nethod and the BP	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v aputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including lea and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro and programmable hardware design kits (FPGA). Cryptography and Security learstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to seed on developing abstract thinking and precise formulation skills using conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. GowL/RDF semantic data represent and on there and isoppring the for conceptual modelling of enterprises and institutes and their processes. The DEMO n isof enterprise engineering, being a discipline for conceptual modelling of enterprises and institutes and their processes. The DEMO n isof enterprise engineering, being a discipline for conceptual modelling of en	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in the ation in the Interna- nethod and the BP	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of com of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation wil BI-KOT Kotlin is a modern	Internet of Things is on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v puter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including and programmable hardware design kits (FPGA). Cryptography and Security ierstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ass based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procee Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. Recommended optional follow-up c Programing in Kotlin n, statically-styled object-functional language that exploits the extensive Java language ecosystem while delivering a number of advar	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in the ation in the Interna- bethod and the BP purse: BI-ZPI. Z,ZK inced language cor	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions.
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of com of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation wil BI-KOT Kotlin is a modern	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec isomputer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v nputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIPO and CAM) will be discussed in detail, including lea and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro and programmable hardware design kits (FPGA). Cryptography and Security leastand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proces Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontological struct learn how to express business rules and constraints using the OCL language and foundations of OWL/RDF semantic data represent ns of	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanaly Z,ZK rms in a domain, t tural modeling in the atton in the Interna- nethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions.
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundatior wil BI-KOT Kotlin is a modern The language is fu	Internet of Things is on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v puter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp le organization of main memory and other internal memories (addressable, LIFO, FIPO and CAM) will be discussed in detail, including lel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ams based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procee Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutes and their processes. The DEMO n I be taught. The course is designed with the respect to continuation in software implementations. Recommended optional follow-up c Programing in	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in the ation in the Interna- nethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. nctional way
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundatior wil BI-KOT Kotlin is a modern The language is fu	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architer sortputer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v pouter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including le and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basics of ordice processes. The problem is using the OCL language and foundations of OWL/RDF semantic data represent is of enterprises business rules and constraints using the OCL language and foundations. Recommended optional follow-up c Programing in KOtlin , statically-styled object-functional language that exploits the extensive Java and continue with the development is of dava IIII dava compliant and allows for mixed projects that pres	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanaly Z,ZK rms in a domain, t tural modeling in the atton in the Interna- nethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur ZK	A actuators, application , ESP, STM; 5 ructure and oblementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. notional way 2
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundatior wil BI-KOT Kotlin is a modern The language is fu	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry PIOS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v oputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp e organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including tel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ams based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procee Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te cify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn skills of discerning key te of the course is designed with the respect to continuation in software implementations. Recommended optional follow-up c Programing in	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanaly Z,ZK rms in a domain, t tural modeling in the atton in the Interna- nethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur ZK y of the world - exa	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. Inctional way 2 amples from
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundatior wil BI-KOT Kotlin is a modern The language is fu	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architer sortputer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v pouter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp ie organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including le and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm d the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basics of ordice processes. The problem is using the OCL language and foundations of OWL/RDF semantic data represent is of enterprises business rules and constraints using the OCL language and foundations. Recommended optional follow-up c Programing in KOtlin , statically-styled object-functional language that exploits the extensive Java and continue with the development is of dava IIII dava compliant and allows for mixed projects that pres	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanaly Z,ZK rms in a domain, t tural modeling in the atton in the Interna- nethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur ZK y of the world - exa	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. Inctional way 2 amples from
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundatior wil BI-KOT Kotlin is a modern The language is fu	Internet of Things on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v puter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp e organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including el and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of comm and the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropre and approgrammable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to sens based on them and learn the basics of safe use of symmetric and asymmetric cryptographic algorithms. They will be able to conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te city correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn skills of discerning key te city correct engineering, being a discipline for conceptual Modelling s of enterprise engineering, being a discipline for conceptual modeling of enterprises and institutes and their processes. The DEMO n I be taught. The course is designed with the respect to continuati	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal! Z,ZK rms in a domain, t tural modeling in the atton in the Interna- bethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur ZK y of the world - exa h, history, death, e	A actuators, application , ESP, STM; 5 ructure and oblementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. nectional way 2 amples from etc) will be
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation wil BI-KOT Kotlin is a modern The language is fu BI-KSA The one-semester anthropological ress	Internet of Things s on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architer computer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v puter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using appropriate acquiration of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including e organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including addressable, LIFO, FIFO and CAM) will be discussed in detail, including and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to ams based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic or occeptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key te ig' correct relations in complex systems of social reality, mostly enterprises and institutions. Recommended optional follow-up rearrise engineering, being a discipline for conceptual modelling of enterprise and institutes and their processes. The DEMO n I be taught. The course is designed the respolets that preserve existing parts written in Java,	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanaly Z,ZK rms in a domain, t tural modeling in the ation in the Interne bethod and the BP purse: BI-ZPI. Z,ZK need language cor modern, object-fur ZK y of the world - exa h, history, death, e	A actuators, application , ESP, STM; 5 ructure and plementation letection and occessor with sor simulator 5 c keys and bs, students ysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. nctional way 2 amples from etc) will be
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation wil BI-KOT Kotlin is a modern The language is fu BI-KSA The one-semester anthropological res BI-LA1.21 We will introduce s	Internet of Things on an overview of technologies and development tools used in the field of the Internet of Things (IoT), Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architer software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail u sputer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp e organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including their basic knowledge of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropre and programmable hardware design kits (FPGA). Cryptography and Security terstand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to sms based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and has functions in appli- actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proceu- ic fu conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn basics of onological struc- learn how to express business rules and constraints using the OCL language and foundations. Recommended optional follow-up or learn how to express business rules and constraints using the OCL language and foundations. Recommended optional follow-up or Programing in Kotlin s, statically-styled object-functional language that explosits the extensive Java language ecosystem while delivering a number of advar with minimum of boiler-plate code. Last but not least, Kotlin is suitable for designing of DSLs (Doma	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanal Z,ZK rms in a domain, t tural modeling in the atton in the Interna- bethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur ZK y of the world - exa h, history, death, e Z,ZK	A actuators, application , ESP, STM; 5 ructure and belementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. notional way 2 amples from atc) will be 5 ex numbers
The course focuses wireless communi areas. Within the c BI-JPO.21 Students deepen organization of corr of multiplication. Th correction for parall the environment an BI-KAB.21 Students will und certificates in syste will gain pra BI-KOM.21 The course is focu categorize and spe notation. Next, they learn the foundation wil BI-KOT Kotlin is a modern The language is fu BI-KSA The one-semester anthropological ress BI-LA1.21 We will introduce s and also over finite	Internet of Things on an overview of technologies and development tools used in the field of the Internet of Things (IoT). Lectures are devoted to an over cation technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architec somputer labs, students will gain practical experience with developing simple IoT systems using common development environments software - Arduino, Raspberry Pi OS). Computer Units their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail v puter units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using approp te organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including the architecture of the bus system. The problems will be practically evaluated in the labs and with the help of the educational micropro- and programmable hardware design kits (FPGA). Cryptography and Security lerstand the mathematical foundations of cryptographic algorithms. They will be able to ans based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in appl actical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic proce Conceptual Modelling sed on developing abstract thinking and precise formulation skills using conceptual models. Students learn basics of ontological struc rearn how to express business rules and constraints using the OCL language and foundations of OWL/RDF semantic data represent ns of enterprise engineering, being a discipline for conceptual modelling of enterprises and institutes and their processes. The DEMO n I be taught. The course is designed with the respect to continuation is oftware implementations. Recommende optional follow-up c Programing in Kotlin , statically-styled object-	view of sensors ar ctures for different (hardware - ARM, Z,ZK vith the internal str riate codes for imp g codes for error d unication of the pro- ogrammed process Z,ZK use cryptographic ications. Within lat dures of cryptanaly Z,ZK rms in a domain, t tural modeling in the atton in the Interna- nethod and the BP purse: BI-ZPI. Z,ZK inced language cor modern, object-fur ZK y of the world - exa n, history, death, e Z,ZK of real and complea	A actuators, application , ESP, STM; 5 ructure and oblementation letection and ocessor with sor simulator 5 c keys and bs, students lysis. 5 the ability to he OntoUML et. They also 2MN notation 4 nstructions. nectional way 2 amples from atc) will be 5 ex numbers M) and show

BI-LA2.21	Linear Algebra 2	Z,ZK	5	
Studenti si v tomto p	o edm tu rozší í znalosti z p edm tu BI-LA1, kde se pracovalo pouze s vektory ve form n-tic ísel. Zde si zavedeme vektorový pros	tor v abstraktní obe	ecné form .	
Seznámíme se také s pojmem skalární sou in a lineární zobrazení, což nám dovolí ukázat souvislost s lineární algebrou, geometrií a po íta ovou grafikou. Dalším velkým tématem				
bude numerická lineární algebra, kde si ukážeme potíže s ešením soustav lineárních rovnic na po íta i a možnosti, jak se s tímto problémem vypo ádat s d razem na rozklady matic.				
BI-LOG.21	Ukážeme si také aplikace lineární algebry v r zných oborech.	Z,ZK	5	
	Mathematical Logic s on the basics of propositional and predicate logic. It starts from the semantic point of view. Based on the notion of truth, satisfiability			
	e of formulas are defined. Methods for determining the satisfiability of formulas, some of which are used for automated proving, are e			
, , , , , , , , , , , , , , , , , , ,	nd Boolean functions in propositional logic. In predicate logic, the course further deals with formal theories, such as arithmetics, and	•		
approach	to mathematical logic is demonstrated on the axiomatic system of propositional logic and its properties. Gödel's incompleteness the	orems is explained	l.	
BI-MA1.21	Mathematical Analysis 1	Z,ZK	5	
0	e by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers.	,	•	
	a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of function ot-finding problems (iterative method of bisection and Newtons method), construction of cubic interpolation (spline), and formulation and			
	sue of finding extrema of functions). The course is closed with the Landaus asymptotic notation and methods of mathematical descripti	•	· .	
BI-MA2.21	Mathematical Analysis 2	Z,ZK	6	
	es the theme of analysis of real functions of a real variable initiated in BI-MA1 by introducing the Riemann integral. Students will learn	,	-	
use the substitutior	n method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylors theorem to the	e computation of e	elementary	
	scribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, an			
-	we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and H		-	
	localization of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integ Modern Data Formats		3	
BI-MDF.21	rse is to give an overview of commonly used data formats for typical types of data. There will be a description of each data type and	KZ	-	
-	along with tools available to work with such data. After finishing the course, the students should know how to work with common da			
BI-MGA.21	Multimedia and Graphics Applications	Z.ZK	5	
	ainted with multimedia technologies and applications for 2D/3D bitmap and vector graphics. During the course, current tools for worl	, ,		
graphics and animat	tion will be introduced. Students learn several basic techniques of creation and editing content in computer graphics, introduction to graphics and the several basic techniques of creation and editing content in computer graphics.	ohic formats, and c	ompression	
	learn to use multimedia transmission and representation systems, including real-time multimedia processing. They understand the p		on and use	
	f graphics processing cards. They gain a number of practical skills, such as vectorizing raster images, retouching photos, or creating			
BI-MIT	Mikrotik technologies	KZ	3	
	n of the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are com rice providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the me			
	rate and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary computer ne			
	and technologies of the data-link, network and transport layer of the OSI model.			
BI-ML1.21	Machine Learning 1	Z,ZK	5	
	ourse is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working ki		sion and	
classification mod	els in the supervised learning scenario and clustering models in the unsupervised scenario. Students will be aware of the relationsh	ips between model	bias and	
variance, and know	the fundamentals of assessing model quality. Moreover, they learn the basic techniques of data preprocessing and multidimensional	data visualization.	In practical	
	demonstrations, pandas and scikit libraries in Python will be used.	7 71/		
BI-ML2.21	Machine Learning 2 urse is to introduce students to the selected advanced methods of machine learning. In the supervised learning scenario, they, in pa	Z,ZK	5 al methods	
-	is. In the unsupervised learning scenario students learn the principal component analysis and other dimensionality reduction method			
	basic principles of reinforcement learning and natural language processing.	,		
BI-MMP	Multimedia team project	KZ	4	
·	This course is presented in Czech.			
BI-MPP.21	Methods of interfacing peripheral devices	Z,ZK	5	
	ed on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universa			
includes both PC si	de and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USE	devices, Linux an	d Windows	
	drivers, simple application development, and APIs of selected devices.	7 71/	-	
BI-MVT.21	Modern Visualisation Technologies Irse is to give an overview of modern visualization technologies and their principles, namely technologies related to virtual and augm	Z,ZK	5	
-	ays (e.g., SAGE and video mapping) and their applications in practice. Several lectures deal with the content creation for the mentione	-		
5	and procedural visualization, scientific data visualization, and 3D model scanning.	0 /	,	
BI-OOP.21	Object-Oriented Programming	Z,ZK	5	
	ogramming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together		ng. In this	
course students get	acquainted with the main principles of object-oriented programming and design, used in modern programming languages. The emph	asis is on practical	techniques	
	for developing software, which includes testing, error handing, refactoring, and application of design pattern.			
BI-ORL	Operations Research and Linear Programming	KZ	5	
-	introduce students to the issues of operational research and primarily to the practical application of linear programming as a fundar nal research primarily focuses on the use of engineering methods (with a mathematical background) to solve practical problems (suc	-		
BI-OSY.21	Operating Systems	Z,ZK	5	
	a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imp			
	ad scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monit			
	and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS W	indows.		
BI-PA1.21	Programming and Algorithmics 1	Z,ZK	7	
-	bility to formulate algorithms for solving basic problems and write them in the C language. They understand data types (simple, struct			
statements, functio	ns, concept of recursion. They learn to analyse simple cases of algorithm complexity. They know fundamental algorithms for searchi	ng, sorting, and ma	anipulating	
	with linked lists and trees.	:/	_	
BI-PA2.21	Programming and Algorithmics 2 nstruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, que		7 rav list set	
	these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e	-		
	copying/moving of objects, operator overloading, inheritance, polymorphism).	3.,p.a.o progr		
L				

BI-PAI.21	Law and Informatics	ZK	5	
	urse is to introduce students into the basic legal instruments that they will encounter in their practice. Students will gain knowledge of	-		
Republic and will be alerted to the pitfalls that await them in business from the point of view of law. They will understand the process of concluding contracts in real and Internet				
environment, will know their responsibilities in working with the Internet, will be familiar with the institutes of intellectual property law, and will be able to use commercial license types and open-source licenses. Emphasis will also be put on the legal protection of data on the Internet, the registration of Internet domains and protection against their misuse. Students				
	ted to such behaviour in the field of IT that can be classified as criminal under the Czech law. The course will also include analyses of	-		
BI-PGA.21	Programming of Graphic Applications	Z,ZK	5	
-	sent the possibilities of current professional open-source tools for image editing, video editing, 3D animation (GIMP, Blender) and their	I ' I	-	
	nathematical data). Emphasis will be placed on the possibilities of further enhancement of the presented software tools, both using b			
	by implementation of plugins.			
BI-PGR.21	Computer graphics programming	Z,ZK	5	
After attending this	curse, students can program a simple interactive 3D graphical application like a computer game or scientific visualization, design the	e scene, add textur	es imitating	
-	nd materials (like wall surface, wood, sky), and set up the lighting. At the same time, they understand the fundamental principles and ter	-		
	pipeline, geometric transformations, or lighting model. They gain knowledge allowing orientation in computer graphics and representing	-	-	
	pment, e.g., GPU programming and animations. They get used to techniques utilized in geometric modeling, modeling curves and surface			
BI-PJP.21	Programming Languages and Compilers asic compiling methods of programming languages. They are introduced to intermediate representations used in current compilers G		5 v loorn to	
	ion of a translation of a text that conforms a given syntax, to a target code and also to create a compiler based on the specification. T		-	
	only a programming language but any text in a language generated by a given LL input grammar.			
BI-PJS.21	JavaScript Programming	KZ	5	
	introduction to Javascript programming. Students will also learn best practices and get acquai nted with tools that make code develo	I I		
BI-PJV	Programming in Java	Z,ZK	4	
	This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	· · ·		
BI-PKM	Introduction to mathematics	Z	4	
	This course is presented in Czech.			
BI-PMA	Programming in Mathematica	Z,ZK	4	
Students will be wo	rking with modern technical and scientific software. Students will learn how to use different programming styles (functional programn	ning, rule-based pro	ogramming,	
	etc.), how to create dynamic interactive applications and visualisations, data processing and presentations.			
BI-PNO.21	Practical Digital Design	KZ	5	
-	rerview of the contemporary digital design flow and learn practical skills to use synchronous design techniques. They understand the			
and implementation	on technologies FPGA and ASIC. Students demonstrate practical use of the design techniques in the course project using modern in tools.	dustry-standard CA	AD design	
BI-PPA.21	Programming Paradigms	Z.ZK	5	
	ith basic paradigms of high-level programming languages, including their basic execution models, benefits, and disadvantages of par	I ' I	-	
	ligm and its basic principles are explained in details. Logic programming is introduced as another way of declarative programming. The			
on lambda calculu	s and on Lisp (Racket) and Prolog programming languages. Moreover, usage of these principles is demonstrated on modern mainstr	eam programming	languages	
	such as C++ and Java.			
BI-PRR.21	Project management	Z,ZK	5	
	urse is to introduce students into the basic concepts and principles of project management, i.e. methods of planning, teamwork, ana			
	cation, argumentation and meeting management. Students will practice project management techniques (e.g. SWOT analysis, risk as purce schedule, resource balancing, network graphs) and creation of project documentation. The course is designed especially for st		-	
	nowledge outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in lar			
	also suitable for all those who will develop software or hardware in the form of team projects.	ge companies. me	, 000130 13	
BI-PRS.21	Practical Statistics	KZ	5	
	e introduced to methods of applied statistics. They will learn how to work with various types of data, perform analyses, and choose mod	1 1		
will encompass re	gression and correlation analysis, analysis of variance and non-parametric methods. Students will learn to use the statistical software	e R and will apply t	he studied	
	methods on data from real problems.			
BI-PS2	Programming in shell 2	Z,ZK	4	
Students gain a ge	eneral overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In additi	on, they gain a dee	eper insight	
	into shell and some other particular scripting languages and will get practical experience with shell script programming.			
BI-PSI.21	Computer Networks	Z,ZK	5	
	ces students to the principles of computer networking. It covers basic technologies, protocols, and services commonly used in local r s will be amended by proseminars that introduce students into network programming and demonstrate the abilities of advanced netw			
	actically verify configurations and management of network devices in the lab within the environment of the operating systems Linux a	-	Sludenis	
BI-PST.21	Probability and Statistics	Z,ZK	5	
	the basics of probabilistic thinking, the ability to synthesize prior and posterior information and learn to work with random variables. T			
	m variable distributions and solve applied probabilistic problems in informatics and computer science. Using the statistical induction	-		
estimations of unk	nown distributional parameters from random sample characteristics. They will also be introduced to the methods for testing statistica	hypotheses and d	etermining	
	the statistical dependence of two or more random variables.			
BI-PYT.21	Python Programming	KZ	5	
	urse is to get acquainted with basic efficient control and data structures of the Python programming language for text and binary data			
	y of programming in Python and in other programming languages will be explained. Each topic is prepared for students in the format			
enables greater ac	ccent to individual student work. Before each lab, students pass a short test on the last week topic. Four homeworks plus a semester the semester.	work will be assign	ieu uuring	
BI-QAP	Quantum algorithms and programming	KZ	5	
	ng students hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanics, o	I I		
-	orithms showing advantages and limitations of quantum computing. During tutorials students work in open-source software developr	-	- 1	
-	ge. Knowledge of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VMN			
	might be an advantage. No previous knowledge of physics is assumed.			

BI-QUA	Quality Assurance	KZ	4	
	budgets students to the fundamentals of testing and quality management. Students will learn what the role of a tester is in the context	1 1		
	will experience hands-on application testing using both manual and automated testing. At the end of the semester, the student should			
analysis, design a set of test scenarios, prepare test data, automate an appropriate portion of the scenarios, and prepare a report on the bugs found in the product under test.				
BI-SAP.21	Computer Structure and Architecture	Z,ZK	5	
Students will get	acquainted with the basic architecture and units of a digital computer, understand the structure, function, and implementation of arith		ontrollers,	
	nunication, methods of data transfers between the units. The logic design and the implementation of a program-controlled simple proce			
	in the labs using programmable circuits (FPGA), a single-chip microcomputer, and modern design (EDA) tools.			
BI-SCE1	Computer Engineering Seminar I	Z	4	
	mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	b failures and attack	ks. Students	
are approached ir	ndividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the	subject is work with	th scientific	
articles and other	professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teache	rs. The topics are n	ew for each	
	semester.			
BI-SCE2	Computer Engineering Seminar II	Z	4	
The Seminar of Co	mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	o failures and attack	ks. Students	
are approached in	ndividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the	subject is work with	th scientific	
articles and other	professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teache	rs. The topics are n	ew for each	
	semester.			
BI-SEP	World Economy and Business	Z,ZK	4	
This course is pre	esented in Czech. The course introduces students of technical university to the international business. It does that predominantly by c	omparing individua	al countries	
	world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as			
corruption and eco	nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of d	iscussions based o	on individual	
	readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite.			
BI-SIP.21	Network Programming	Z	5	
	s fundamental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level program			
	oted to designing communication protocols and their verification. The third part introduces the principles and applications of middlewa	•	•	
introduces basi	c modern models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in co	mputer labs using	a chosen	
DI OKLOA	programming language environment.	7 71		
BI-SKJ.21	Scripting Languages	Z,ZK	4	
Students gain a g	eneral overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In additi	on, they gain a dee	eper insignt	
	into shell and some other particular scripting languages and will get practical experience with shell script programming.	1/7	<i>г</i>	
BI-SP1.21	Team Software Project 1		5	
-	ands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in th hat teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teach			
-	ularly consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software ar			
project leader, reg	and finished in the BIE-SP2 course.		i developed	
BI-SP2.21	Team Software Project 2	KZ	5	
-	ds-on experience with the iterative development process while working on a large-scale software project. The first iteration is the result		-	
	follow-up, the functionality, testing, and documentation of the software system being developed will be emphasized. Students will wor			
teach	er, in the role of the team and project leader, regularly consults with the team (at the seminars) the formal as well as material aspects	s of their solution.		
BI-SPS.21	Administration of Computer Networks and Services	Z,ZK	5	
The aim of the cou	irse is to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrate	d under the operat	ing systems	
Linux and Window	s. The course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained by	practical hands-on	experience	
	with real network infrastructure.			
BI-SQL.1	Language SQL, advanced	KZ	4	
	n knowledge obtained in BI-DBS. Students become familiar with advanced relational and non-relational features of SQL language. In pa			
	queries, OLAP support, object-relational constructions. Part of the course is dedicated to practical database optimization from the point	-		
	lexes, clusters, index-organized tables, and materialized views. as well as from the point of view query optimization. Execution plan and		•	
WIII DE discuss	ed. Lectures will usually discuss SQL standard, but many features will be demonstrated on Oracle DBMS. Seminars are based on Oracle DBMS.	acle DBINS and pai	rtially on	
	PostgreSQL.	7 71/	-	
BI-SRC.21	Real-time systems	Z,ZK	5	
	he basic knowledge in the real-time (RT) system theory and in the design methods for RT systems including the dependability issues		-	
leciules will be ex	perimentally verified in computer labs. The course is mainly focused on embedded RT systems, therefore the design kits in the lab ar course.		IE DIE-VEO	
BI-ST1	Network Technology 1	Z	3	
	INERWORK TECHNOIOGY T riented to providing the students basic information and practical skills from the area of digital and IP networks. The subject is acredite	1 1	1	
	CCNA1 - R&S Introduction to Networks.			
BI-ST2	Network Technology 2	Z	3	
	This course is presented in Czech.			
BI-ST3	Network Technology 3	Z	3	
	er enhance their knowledge acquired from previous BI-ST1 and BI-ST2 courses. Principles of routing and switching presented during B	1 1	-	
	ded in the course. Students will be able to start fine-tune protocols' settings to gain certain advantages like increased efficiency, pred			
	simple topology, security, etc.		.,	
BI-ST4	Network Technology 4	Z	3	
	er enhance their knowledge already acquired from previous BI-ST1, BI-ST2, and BI-ST3 courses. Principles of routing and switching		-	
	ot further extended in BI-ST3. Students were able to start fine-tune protocols' settings to gain certain advantages like increased effici			
-	e topology, security, etc. This module teaches students to configure and fine-tune Wide Area Networks and to experience a completely			
Broadcast Multip	le Access) which radically differs from well-known Ethernet (broadcast) type of networks. Students will also manage router and switch	n firmware, perform	password	
recoveries and e	mercanaly presedures. Also the accurity consect is treated, students will leave people intro, and inter petwerk attacks and the mitigati	on wave while mair		
	nergency procedures. Also the security aspect is treated; students will learn possible intra- and inter-network attacks and the mitigati	on ways while mail	ntaining the	

BI-SVZ.21	Machine vision and image processing	Z,ZK	5
	are becoming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluate in	•	
introduces students	s to different types of camera systems and a variety of methods for image and video processing. The course is focused on practical use problems of practice that the graduates may encounter.	of camera system	s for solving
BI-SWI.21	Software Engineering	Z,ZK	5
	ainted with methods of analysis and design of larger software projects that are typically designed and implemented in teams. They co		-
	ring the analysis and design of larger software systems that will be developed in the concurrent course BIE-SP1. Students get hands-		
-	nguage UML for modeling and solving software problems. Students learn the basics of object-oriented analysis, architecture design a	-	the course,
	udents also gain a theoretical basis in the field of project management, estimation of costs of software projects, and methods of their		
BI-TAB.21	Applications of Security in Technology	Z,ZK	5
The goal of the co	urse is to introduce students to selected topics from cybersecurity technical applications that are utilized in different industries. Stude cybersecurity applications and extend their knowledge from the cryptology, the secure code, and system, network, and hardware	-	overview of
BI-TDP.21	Documentation and Presentation	KZ	3
	sed on the basics of creating electronic documentation with emphasis on the creation of technical reports of a larger scope, typically fi		
learn to create text	of a technical report in the LaTeX system, process an electronic presentation using the LaTeX Beamer system, and practically prese	nt it in front of clas	smates 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.		-
BI-TEX	TeX and Typography	Z,ZK	4
i his course is pres	ented in Czech. This course gives basics of programming in TeX (plain TeX, ConTeXt, LaTeX, OpTeX, LuaTeX). Te second part of the rules.	course focuses on	typographic
BI-TIS.21	Information Systems	Z,ZK	5
	purse is to familiarise students with the information systems topic and information systems implementation principles. During the court	1	-
-	kisting types of systems and their usage in specific industry segments. Students are familiarised with the CRM, ERP, MRP and other		
The fundamen	tal part of the course is the introduction to key ideas of an information system selection, evaluation of information system benefits, wa	ays of information s	systems
•	d information system implementation based on the project management principles. The emphasis is on the initial customer analysis,	•	
	better to implement any existing information system or to develop a new one from scratch. These factors determine the information system	-	
BI-TJV.21	of the course information systems security, operation, support, maintenance, legislation impacts, and government information system		5 5
	Java Technology de knowledge and skills for developing information systems and applications through concepts used in software development and exp	Z,ZK	-
The gearle to provi	from Java language ecosystem. At the course end, the students are able to develop software systems in Java platform.		
BI-TPS.21	Computer Networks Technologies	Z,ZK	5
The course introd	uces students with basic and advanced technologies, components, and interfaces of contemporary computer networks at the physica	al layer with the over	erlap to the
-	res provide theoretical foundations of these technologies and explain relevant physical principles. In the labs, the respective technologies and explain relevant physical principles.	-	
with the most impo	rtant ones students will get hands-on experience. Thematically, the course covers both local and long-range optical networks, Ethern	et, modern wireles	s networks,
	always with focus on high-speed networks. Theoretical Seminar I	7	4
BI-TS1	r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic	<u> </u>	•
	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a		
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.		
BI-TS2	Theoretical Seminar II	Z	4
	r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic		
are treated individu	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a vertex cabelerly literature. The concern the latest research in the protection of the concern the second secon	work with scientific	papers and
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.	Z	4
BI-TS3	Theoretical Seminar III r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic	1 1	
	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a		
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.		
BI-TS4	Theoretical Seminar IV	Z	4
	r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic		
are treated individu	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a vertex state and back literature. The course is a vertex state and the state and back literature.	work with scientific	papers and
BI-TUR.21	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar. User Interface Design	Z,ZK	5
	asic overview of methods for designing and testing common user interfaces. They get experience to solve the problems where softwa	1 ' 1	
-	the user optimally, since the needs and characteristics of users are not taken into account during product development. Students gai		
	bring users into the development process to ensure optimal interface for them.		
BI-TWA.21	Design of Web Applications	Z,ZK	5
	of web application development. Initially, the students become familiar with HTTP and its possibilities and partly with some propertie		-
	and presentation of document on the Web (CSS). These skills provide the necessary basis for the development of Web applications,		
modern ibraries ia	acilitate the development of Web pages applications. Server side will be demonstrated on PHP technology using frameworks Symfony on the client side will be demonstrated using a JavaScript language with library jQuery and possibly MV* framework React		velopments
BI-TZP.21	Technological Fundamentals of Computers	Z,ZK	5
	inted with the fundamentals of digital and analog circuits, as well as basic methods of analyzing them. Students learn how computer si		
-	oduced to the function of a transistor. They will understand why processors generate heat, why cooling is necessary, and how to redu	-	
limits to the maxim	num operating frequency are and how to raise them; why a computer bus needs to be terminated, what happens if it is not; how a com	nputer power suppl	ly looks like
	(in principle). In the labs, students model the behavior of basic electrical circuits in SW Mathematica.	7 71/	~
BI-UKB.21	Introduction to Cybersecurity urse is to provide students with the introduction of basic concepts in modern approach to cybersecurity. Students will get a basic over	Z,ZK	5 syberspace
The goal of the CO	and attacker techniques, security mechanisms in networks, operating systems and applications, as well as of basic cyberspace reg		Synershare
BI-ULI	Introduction to Linux	Z	2
	familiar with the basics of the Linux operating system using e-learning form. They learn to work with the command line and become f	1 1	
	and techniques of a Unix-like system. Topics can be studied first theoretically and then practically verified in a virtual machine (te	rminal).	

Uncluste operating performance a large lemity mattery course close nature back by funging during the intery of consustant difficult incredible buckness in the same with a large setting and large setting and with a large setting and with large setting and with a large setting and with large setting and with a large setti	BI-UOS.21	Unix-like Operating Systems	KZ	5			
precesso and theads, access inplice and user identify, them, or handling lifes in a file system. They leads to surplice and explicit and the strength injertices, calculate strength injerting, calculate strength injer strength injertices, calculate							
orb at bit to title powerful system too that are mained to using, but the pain and the using the units cartent patients, and a special set to the special system of the output				-			
BI-VMA:21 Selected Applications of Combinatorics Z 3 Bi-VMA:21 Selected Applications to benches of theread an analyze apporting and introduce some basic macunes. Furthermose, the accure arms to introduce some basic basic macunes. Furthermose, the accure arms to introduce some basic basic macunes. Furthermose, the accure arms to introduce some basic basic macunes. Furthermose, the accure arms to introduce are the accure and introduce some basic basic macunes. Furthermose, the accure arms, the accure arms							
The course alreads of includoe students are accessible for the output and explore some and combinence. In contrast to the sole courses, we approach the subjects on the sole courses, we approach the subjects on the sole courses. We approach the sole courses on the sole courses. We approach the sole courses on the sole courses. We approach the sole courses on the sole courses on the sole courses. We approach the sole courses on the sole courses on the sole courses. We approach the sole courses on the sole courses on the sole courses on the sole courses. We approach the sole courses on the sole course on the sole courses on the sole cour							
siste form applications to theirs; "Digenet, we will first refer the base honologies reduct to despin and network applications of the storks, we will an extractions and event the store applications of sturks, we will an extractions and event the store applications and event the store applications and event the store and applications. The store store of the store and the store applications and event the store and applications. The store store of the store and the store applications and event the store and applications. The store store applications are store the store applications and event the store applications and event the store applications. The store store applications are store applications and the store applications and the store applications. The store store applications are store applications and the store applications are store applications. The store store applications are store applications and the store applications are store applications. The store store applications are store applications are store applications and the store applications. The store store applications are store applications are store applications and the store applications are store applications and the store applications are store applications and the store applications are store applications. The store applications are stored applications and the store applications and the store applications and the store applications. They application are stored applications and the store applications are stored applications. The store application applications are stored applications and the store applications are stored applications. The store application applications are stored applications and the store applications are stored applications. The store application applications are stored applications and the store applications are stored applications and the stored applications are stored appli				-			
with the scale participation of audiophilic or scaling propular and assignting approximation assigntimes, approximation algorithms, approximation algorithms, approximation and approximations, and approximations, approximation and approximations, and approximations, approximation approximation and approximations, approximation approximatio approximatio approximation approximation approximation approxima							
wit seke problems to be scheed wit invude, to reasynge, apph freery, combinational and algorithmic game algorithmic, algor							
Bit VPC 2.1 Call							
The alm of the ourse is to familiarize students with technology base of closed computer systems. It shows propose and technology used in degrad mellementation of data construct transformations, such as winds wind of winds and mellementation of data construct to collid and by did douds. Student is anno current transformation in the architecture of II infrastructure and te configuration for dease and closed applications. Students will underteamed the design and hydrid douds. Student is annowed the proposed of the most common microcontrollers and executed to the students. The constructure data constructure of the students and develop otherwises. The course galance vertices, custage, and data losses. Bit VES.21 Students is anno toolegin entructures of the most common microcontrollers and enclosed on the enclosed of the most common microcontrollers and enclosed on the enclosed of the most common microcontrollers and enclosed on the enclosed of the enclosed on the enclosed							
Indextructure, such as various tories of virtualization and high sealability of servers, storages, and subsere leyers. The course guides through and policitions. Subserts will understand the objection of spinic ourses. Subserts will constrained the objections. Subserts will constrain the integrate of constrained the objections. Subserts will constrained the objections. Subserts will be accessed to the CPS specialization. They get basic knowledge of the most corrunn increacortheles and model do crocesses, their integrated or the constrained will be a flate will be a flat	BI-VDC.21	Virtualization and Data Centers	Z,ZK	5			
to public and hybrid clouds. Student team current terms in the achitecture of TI infeastructure and its configuration to classic and cloud applications. Students values used to complex infrastructures for moders applications with respect to calability and protection against corections, and develops of the most common incracocatoroles and antibused on proteins. The students is the models and the students is the models of the most common incracocatoroles and embedded processons, their integrated actures integrated increases and their integrates for the model and the students is the models. Students is the models of the students in the students in the students in understanding data, their corrent and their protections and the students in understanding data, their corrent and their application is and activates and the students in understanding data, their corrent and their protections and the students in understanding data, their corrent and their protections and the students in understanding data, their corrent and their protections and the students in an understanding data, their corrent and their protections and their data activation in the students in understanding data, their corrent and their protections and their data activations and their students. The weight and sciences and their data activation in the students in understanding data, their corrent and their protections and their data activations. Selected mathematics of the students and their protections and their data activations. Selected Mathematics on their students and their protections and their protections. Selected mathematics of the students and their protections and their protections. Selected mathematics of their students and their protections and their protections. Selected mathematics activates are their students and their protections and their protections. Selected mathematics activates and their protections and their prote	The aim of the cou	se is to familiarize students with technology basis of cloud computer systems. It shows principles and techniques used in design and	implementation of	data center			
elsergin, validation, and generator of complex infrastructures for morem applications with respect to scalability and protein again contracts, notaging, and table to scalability and protein again contract fully again and the scalability of the provides of the not accurate for the not accurate for the notage infrastructure for the notage infr	infrastructure, suc	h as various kinds of virtualization and high availability of servers, storages, and software layers. The course guides through data cer	nter technologies fro	om private			
BI-VES.21 Embedded Systems Z.ZK 5 Bi-VRS.21 peripheral circuits, grogramming method, and applications. They get practical skills with development kits and double. Z.ZK 5 Bi-VRS.21 Virtual grame worlds. Z.ZK 5 In the course students learn methods to create a complex virtual world. It is a billow up course of back courses of the PS specialization (BI-KA, BI-FGR). Students grain knowledge) the back org grame design. d principles of writing datograme and the set and the students in order data and the set and the students in order data and the students and the student and the students and the student and the students and the student and the students and the studentstand the students and the		.					
Students learn to design embedded systems and sevelop advance for them. They get basic forwakedge of the most common microcontrollers and embedded programming methods, and and splications. They get practical stills with velocity methods is and splications. They get practical stills with velocity methods is and splication. They get practical stills with velocity methods is and splication. They get practical stills with velocity methods is and splication. They get practical stills with velocity methods is and splication. They get practical stills with velocity methods is and splication. They get practical stills with velocity methods is and splication. They get practical stills with velocity methods is and splication in area such as data method is and barrend as unable by splication methods. This will all the autoents in understanding data, their contrast and the application in area such as data methods, their selectical stalls and splication. The Phylon programming language. Bi-DVM Splication is and splication of the association in area such as data methods and the accuracy stude by splication methods. This will all thread controls the avoider target methods and splications of abarrend as and the accuracy stude as and the	-						
peripheral acroups, programming methods, and applications. They get practical skills with development is and accounse of the PCs specialization (EMAS, BE-PCR). Subartis gain knowledge the theory of game design, of principles of writing dislogues and characters in order to create a functional virtual work! Writin the tabs they get practical skills writin team development work on the samester project. BI-VIZ_1 Data Visualization RC 2_ZK S The course differs an overview of the spess and characters in the hybro programming language. BI-VMM Selected Mathematical Methods C 2_ZK S C 2_K S S SUMMA Selected Mathematical Methods C 2_ZK S S SUMMA SELECT S SUMMA SELECT SELECT S SUMMA SELECT SELE	-	-	I ' I	-			
BI-VPS.21 Writual game worlds IZ-X 5 In the ocurse students sum methods to create a compositivitium world. It is informed provider to serve correse of the PS specialization (BE MAA, BLE-PS). Students gate in compositivity of an extension of the server server of the server of game design, of principles of writing dialogues and characteria or derito create is a functional writual world. Writin the labs they get practical akilits writin is and development work or the server server of the special creater and the server of game design, of principles of writing dialogues and characteriates of data as well as a totable visualization methods. The will aid the students in understanding data, bair contract and their application in areas such as data intring within the course, students will be introduced to exploratory data analysis, preprocessing, and ways of visualizing different kinds of data such as test, social networks, ime series to baic image data principles in the Python priorgamming language. Z/ZK 4 BI-VIMI Selected Mathematical Methods Z/ZK 4 The lacture begins with an information (DT in priorgamming language). Z/ZK 4 BI-VISS.21 Selected Mathematical Methods Z/ZK 5 BI-VISS.21 Selected Mathematical Methods Z/ZK 5 BI-VISS.21 Selected Topics in Computer Networking Z/ZK 5 BI-VISS.21 Selected Topics in Computer Networking Z/ZK 5 BI-VISS.21	Students learn to d		led processors, thei	r integrated			
In the course students beam methods to create a complex virtual workl. It is a fully-up course of the PCs preciational for the MAS, BE-PCRT, Sudents gain fromwides of the theory of game design, of principles of wring dislogues and characters in order to create a functional virtual workl. Within the labs they opt practical stills within team development work on the sensetier project. BI-VIZ_1 Data Visualization K2Z_5 Dife course offers an overview of the types and characteristics of data as well as suitable visualization methods. This will add the students in understanding data, their content and there application in areas such as data mining and machine learning. Within the course, students will be introduced to optication data analyses, and work of visualizing different fully of data such as text, social networks, time series or basic image data processing. Students will be thands on experience in application in areas for such extendes and the prince programming button to the analysis of compare visualities, and there properties, further, we introduce and study the progenties of the Discrete Fourier Transform (DFT) and ts fast implementation (FTT) wells advect the networks course (E-PF), obligationy for the program. Students will learn in data processing acamples. BI-VPS.21 BI-VPS.21 Selected Topics in Computer Networks (me present the Lebesgue integrills. With one computer retworks from because and study the program. Students and wide area networks from the classes the wavelet transform. (DFT) and ts fast implementation (FTT) wells and internet optication in works and wide area networks from the classes from the response of monostrum with the advectore networks of the from the study of the program. Students will and inclusions from the velocity and principles of the control with advectore networks from the velocity and will all responses. The extended by the study of the program students and the text and the program. Students acquire intervents and there are an evelocity of there and there are anothere and th				_			
of the theory of game design, of principles of writing dialogues and characters in order to create a functional virtual world. Within the latis they get practical skills within team development with on the semicart project. SI-V12.21 Data Visualization A C C C C C C C C C C C C C C C C C C		•					
work on the semistar project. BI-VIE.21 Data Visualization KZ 5 The course offers an overview of the types and characteristics of data as well as subtible visualization methods. This well and the subtible visualization (FFT). We discuss the wavelet transform. We example in the Python programming language. BI-VIMM Selected Mathematical Methods Z,ZK 4 The lecture begins with an introduction to the analysis of complex functions of a complex nucleum variable. Next, we present the Lobergue integral. We then address Fourie series and held properties. Further, we introducte and subty the properties in Computer Networking Z,ZK 5 The course builds upon the Computer Networking Z,ZK 5 The course builds upon there were the lead areas and well areas networks form the visualization. The methods the one analysis and computer methods to computer network form to course the network of motion and regularization previous and regularization and regularization previous and regularization previous and regularization in a data advisation in advisatis and regularization in advisation and regularization in			, .	٠ ·			
BI-VI2.21 Viz.01 KZ 5 The course effets an overview of the types and charachine lidaning. Within the course, students will also the students in updata analysis, proprocessing, and ways of visualizing different kinks of data such as test, social networks, time series or basic image data processing. Students will get hands-on experience in applications of selected methods to real-world camples in the Python programming language. Z,ZK 4 BI-VIMM Selected Mathematical Methods Z,ZK 4 5 The lacture begins with an introduction to the analysis of complex functions of a complex nonlinod on a complex nonlinod on to anomplex nonlinod on to anomplex nonlinod in the single is demonstrated with interesting examples. 2,ZK 5 BI-VPRS 21 Selected Topics in Computer Networking Z,ZK 5 The course builds upon the Computer Network course (RFP), buildparty of the program. Subart with larm in detail principles, protocols, and technologies used in node nonuprite networks from to visual as and with an an anal wide area an envoke from the visuopoint of functionality, performance, and security. Z,ZK 5 BI-VR1 Virtual reality 1 Virtual reality 1 KZ 4 Continuation of the course builds and subart weak within an indeprinciples, protocols and technologies and the analysis and within an analysis and within an analysis of the subarts in analysis and within a more course in the subart methods of coal analysis and within ananalysis of within anana	or the theory of gain		Skills within team of	evelopment			
The course offers an overview of the types and characteristics of data as well as suitable visualization methods. This will add the storestanding data, their content and their application in areas suita data amounts of the induced to expression. Subdents will add the storestanding data, their content and their application in areas suita data mining and machine learning in the Python programming language. BI-VMM Selected Mathematical Methods Z/K 4 The biccure bigers with an introduction to the analysis of complex incidence of a complex multioned on a complex multioned on a complex multioned on a complex multioned on the subscription in the data providence in the adverse for complex multioned on a complex multioned on a complex multioned on a complex multioned on a complex multioned on the subscription in detail principles, protocol, and technologies used in moder nomputer methods for the comparison (BF-R), doll gatacelly of the program. Sub-dres will sam the subscription in the data multipartical methods complex multioned on a multipartic multipartical methods. Z/K 5 BI-VPS 2.1 Selected Topics in Computer Networking Z/Z 5 The course builds upon the Computer Networking subscription of the program. Sub-dres will sam the subscription in detail principles, protocol, and technologies used in moder nomputer methods for modula computer methods for the comparise will be comparise and will be an align scription will will be comparise and the subscription in detail and its solution unique data store and will be and store and will be analysis of the adverse store and will be analysis of the adverse store and adverse and will be analysis of the adverse store and will be analysis of the adverse store adverse store adverse store adverse store adverse store adverse	BI-\/I7 21		K7	5			
application in areas such as data mining and machine learning, Whith the course, students will be introduced to exploratory data analysis, preprocessing, and ways of visualizing BI-VMM Selected Mathematical Sudents will be introduced to exploratory data analysis, preprocessing, and ways of visualizing BI-VMM Selected Mathematical Matheds Z,ZK 4 The learner begins with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lobesgue integral. We then address Fourier series and their properties of the Biocreb Fourier Transform (PT) and its last implementation (PT). We docuse the wavelet transform. We examine the learner organization gradem in more detail and its solution using the Simplex adjointin. Each topic is demonstrated with interesting examples. BI-VPS.21 Selected Topics in Computer Networking Z,ZK 5 BI-VPS.21 Selected Topics in Computer Networking course (BLPS), obligatory to the program. Students will be introduced to visualizing the advection on the enders organizing predication exploration with a networks to the enders of the advection advection and the security. Z,ZK 5 BI-VR1 Virtual reality reality (IT) KZ 4 Introduction to Virtual Reality (VI, virtual reality vertual reality reality in the advection advecti			1	-			
different kinds of data such as text, social networks, time series or basic image data processing. Studens will get hands on experience in applications of selected methods to real-world sexamples in the Pythan programming language. ZZK 4 BI-VMM Selected Mathematical Methods Z,ZK 4 The lecture begins with an introduction to the analysis of complex variable. Next, we present the Lobesgue integral. We then address Fourie ransform. (We assample the integrate address Fourie ransform (DFT), we discuss the wavelet transform. We examine the integrogramming problem in more detail and is solution using the Simplex algorithm. Each tepic is domentated with intreeding examples. BI-VPS 2.1 Selected TOpics in Computer Networks course (BI-PSI), obligatory for the program. Students will been indetal principal practical experimence with real networks devices in the lob and learning important methods of local area and wive adve area networks from the viexpoint of functionality, performane, and security. 4 Introduction to Virtual Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the using in the ourse of use and requirements to iduated and virtual reality realities in deductional virtual 3D worlds. It improves computational thinking, empaty and shared social activities. 4 BI-VR1 Virtual reality I. The new course focuses on collaborative biopresence, spatial compting and social life of avatars. The objective is to develop applications for computer science and gamilication in various social metaveres and desktop empas. 3 Continuation of the course Virtual Reality I. The new co			e				
BI-WMM Selected Mathematical Methods Z,K 4 The lecture begins with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then address Fourier series and their properties. Turther, we introduce and study the properties of the Discrite Fourier Transform (DFT) and its fast implementation (FTT). We discuss the wavelet transform. We examine the linear programming problem in more detail and its solution using the Simplex adjorithm. Each topic is demonstrated with interesting examplex. BI-VPS.21 Selected Topics in COmputer Networks group and the program. Students will learn in detail principles, protocols, and technologies used in modern computer networks from the visepoint of functionality, performance, and security. Z,ZK 4 BI-VRS.11 Virtual reality of the program. Students will learn in detail principles, protocols, and technologies used in modern computer networks from the visepoint of functionality, performance, and security. 4 BI-VR2 Virtual Reality (VR), virtual reality topic and visual reality creation. Another objective is to meet the rules and requirements of virtual works communication. The course focuses on toleways of teaching using virtual reality technologies and interactive activities in develop engines. KZ 3 BI-VR2 Sourching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in thet and the performance, and social life of avatars. The objective is to develop applications for computer science and gaminitation in arrous social methy				- 1			
The lecture begins with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then address Fourier series and their properties, Further, we introduce and study the properties of the Discrete Fourier Transform (DFT) and its fails implementation (FFT). We discuss the weaker transform. We examine the linear programming problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examplex. BI-VPS.21 Selected Topics in Computer Networks (or each EP-SI), obligations will be and learning important methods of local area and weak area networks is mole and instantial experience with real networks devices in the lab and learning important methods of local area and weak area networks is mole and examples used in modern computer network from local area networks area networks area networks and exist. BI-VR1 NINAL Reality (VR), virtual reality operating system and virtual reality realities in declaritional virtual 3D worlds. It improves computational thinking, empathy and stands and shared social activities. BI-VR2 Virtual Reality (VR), virtual reality reality technologies and interactive activities in declaritional virtual 3D worlds. It improves computational thinking, empathy and social life of avatars. The objective is to device papelications for computer science and againflaction in various social metavers and destop engines. BI-VR2 Second the course Virtual Reality (VR). Virtual reality esting agmittation in various social metavers and destop engines. BI-VWL21 Second the course into the expension of the week pages themselves and destop engines. BI-VWL21 Second the course is to exard therpingues in the week proteod of summation in the operational science week and the expension of the course is to teach students of a site of the second real destop engines. BI-VWL21 Not		examples in the Python programming language.					
properties. Further, we introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the vavelet transform. We examine the linear programming problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. BI-VPS.21 Selected Topics in Computer Networking Z,ZK 5 The ourse builds upon the Computer Networks course (BI-PS), obligatory for the program. Students will learn in detail to on gaining practical experience with real networks devices in the lab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, and security. BI-VR1 Virtual reality of the course virtual worlds communication. The course focuses on the ways of teaching using virtual reality technologies and interactive activities. KZ 4 BI-VR2 Virtual reality all to the course virtual Reality 1. The new course focuses on colloarotive telepresence, spatial computing and social life of avatars. The objective is to develop applications to computer science and gamilication in various social metavares and about feature extraction from web pages. They get detailed knowledge of simulary search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students acquire information about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students acquire information about development of a students will get metadevelop and about feature extraction from web pages. They get detallead knowoledge of simulary search in multimedia databases (gene	BI-VMM	Selected Mathematical Methods	Z,ZK	4			
the linear programming problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. BI-VPS.21 Selected Topics in Computer Networkig Z,ZK 5 The course builds upon the Computer Networks course (BI-PSI), obligatory for the program. Students will learn in detail principles, protocols, and technologies used in modern computer network torm local area and with area networks from the verybant of Nucleal Network devices in the lab and learning important methods of local area and with area networks from the verybant of Nucleal Network and learning important methods of local area and with area networks from the verybant of Nucleal Network and Virtual NetWorks communication. The oronse focuses on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves computational thinking, empathy and shared social activities. KZ 4 BI-VR2 Virtual reality I KZ 3 Continuation of the course Virtual Reality I. The new course focuses on colloaconable telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamintation in various social metawares and desktop engines. KZ 3 BI-VWM.21 Searching the Web and Multimedia Databases Z,ZK 5 BI-VWM.21 Searching the Web and Multimedia Databases Z,ZK 5 BI-VWM.21 Intelligent embedded system fundamentals ourse is focused on hinph-level technology embedded system integrating artificial intel	The lecture begins	s with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then ad	dress Fourier serie	s and their			
BI-VPS.21 Selected Topics in Computer Networking Z,ZK 5 The course builds upon the Computer Networks course (BI-PS), obligatory for the program. Students will learn in detail principles, protocols, and technologies used in modern computer networks for tho class area networks up to Internet, with locus on switching, routing, security, and virtualization. The emphasis will be on gaining practical experience with real network devices in the lab and learning important methods of local area and wide area networks from the velopent of functionality, performance, and security. Security and the security and virtual reality computing and virtual reality computing and social string. Security and security and security and virtual reality computing and virtual reality computing and social activities. KZ 4 BI-VR2 Virtual reality in technologies and interactive activities in educational virtual 30 worlds. It improves computational thinking, empathy and shared social activities. KZ 3 BI-VR2 Searching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in the web environment that is interpreted as a very large distabases of programming web search engines to the mentional data types (accuments). KZ 4 BI-VINA Intelligent Embedded System Fundamentals KZ 4 Students get basic overview about search techniques in the web environment that is interpreted as a very large distabase (accuments). In particular, students to develop path adata types (accuments).	properties. Furthe	r, we introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the w	avelet transform. W	e examine			
The course builts upon the Computer Networks course (BI-SI), obligatory for the program. Students will learn in detail principles, protocols, and technologies used in moderim computer networks from clarase networks to pto Internet, with focus on switching, routing, security, and virtualization. The emphasis will be on gaining partical experience with real network devices in the lab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, and security. BI-VR1 KZ 4 Introduction to Virtual Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the rules and requirements of virtual worlds communication. The course focues on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves computational thinking, empathy and shared social activities. BI-VR2 KZ 3 Continuation of the course Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamification in various social interactive as and tesktop engines. BI-VMM.21 Searching the Web and Multimedia Databases Z,ZK 5 Students acquire information about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from web pages. They get detailed knowledge of similarity search engines for the emotioned data types (focuments). BI-ZIVS NItelligent Embedded System Fundamentals of motion control, sensor reading, application interface as to bus students and phase is to teach at the students of oracion and development to dapplications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot analysis and development to das. In tabs, students program as set of basic task by using the robot simulatoria and real hardware to get			ig examples.				
networks from local area networks up to Internet, with focus on switching, routing, security, and virtual/aztion. The emphasis will be on gaining practical experience with real network from the viewpoint of functionality, performance, and security. BI-VR1 KZ 4 Introduction to Virtual Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the rules and requirements of virtual worlds communication. The course focuses on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves computational thinking, empathy and shared social activities. KZ 3 BI-VR2 VIrtual Reality I. The new course focuses on collaborative telepresence, spatial computing and docial life of avatars. The objective is to develop applications for computer science and gamilication in various social metawares and desktop engines. Z.ZK 5 BI-VR2 Searching the Web and Multimedia Databases Z.ZK 5 Students acquire information about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students acquire information about search techniques in text and hypertext documents (the web pages themselves) and about feature estraction from web pages. They get detailed model multimedia databases (generally in collections of unstrutured data). They also learn techniques of programming web search engines for the emitode data types (documents). KZ 4 Intelligent Embedded system fundamentals cororice is blocased on high-level technology semende systems integr	-		I ' I	-			
devices in the tab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, and security. BI-VR1 KZ 4 Introduction to Virtual Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the rules and requirements of virtual words communication. The occurse focuses on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves computational thinking, empathy and shared social activities. BI-VR2 Virtual reality II KZ 3 Continuation of the course Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamilication in various social metaverse and desktop engines. ZKK 5 BI-WM.21 Searching the Web and Multimedia Databases Z,ZK 5 Students gati basic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In entroduct, stata types (accuments). KZ 4 BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system inducementation of applications in a graphication web present students modern humanoid robot control and development tos. In labs, students will get necessary foundations for understanding formal principles of process modeling and they will actoworeas to teaching on this subject. Students wi			-				
BI-VR1 Virtual reality Virtual reality creation. Another objective is to meet the rules and requirements of virtual works communication. The course focuses on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D works. It improves computational thinking, empathy and shared social activities. KZ 4 The course focuses on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D works. It improves computational thinking, empathy and shared social activities. KZ 3 BI-VR2 Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamilication in various social metaveres and destop engines. ZZK 5 BI-VWM.21 Searching the Web and Multimedia Databases ZZK 5 Students get basic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, tsudents acquire information about search techniques in text and hypertext documents (the web pages themeshee) and about feature extraction from web pages. They get detailed knowledge of simularity search in multimedia databases (generality in collections of unstructured data. Three altero extraction from web pages. They get detailed twowledge of simulator and real hardware to get practical experience with these technologies. BI-ZVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedde				al network			
Introduction to Virtual Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the rules and requirements of virtual worlds communication. The course focuses on the ways of teaching using virtual reality technologies and interactive activities in development virtual 3D worlds. It improves computational thinking, empthy and shared social activities. BI-VR2 Nirtual reality 1I KZ 3 Continuation of the course Virtual Reality 1. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamilication in various social metaverse and desktop engines. SIVVM.21 Searching the Web and Multimedia Databases Z.ZK 5 Students get basic overview about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from web pages. They get detailed trowedge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). MZ 4 Intelligent embedded System fundamentals course is to case in a graphical development environment. Lectures provide fundamentals of motion classes reading, application interfaces, robot navigation and development tools. In tabs, students program as et of basic task by using the robot simulator and real partexical experience with these technologies. MZ 4 BI-ZPI Process engineering in this subject. Students will get national principles of process modeling and they will learn basics of Nystem Control Z							
The course focuses on the ways of teaching using virtual reality technologies and interactive activities. Induced to the course Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamilication in various social metaverse and desktop engines. BI-VR2 Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for owney the science and gamilication in various social metaverse and desktop engines. BI-VWM.21 Searching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students get detailed knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is to classe of adaption, application interfaces, robot navigation and development of applications in a graphical development mixmorement. Lectures provide fundamentals of motor course, servide and they will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject leas in trainning of pracical skills of formalistion and modelling		, , , , , , , , , , , , , , , , , , ,	1 1				
BI-VR2 KZ 3 Continuation of the course Virtual Reality I. The new course focues on collaborative teleprescree, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamification in various social metaverse and desktop engines. KZ 3 BI-VWN.21 Searching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students acquire information about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from web pages. They get detailed knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is to teach students modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and modelling of business processes using modern CASE tools. The role of process engineering in this subject. Students will get necessary foundations for understanding formal principles of processe eusing modern CASE tools. The role of process engineering to information systems development is discussed as well as its importance in							
BI-VR2 Virtual reality II KZ 3 Continuation of the course Virtual Reality I. The new course focuese on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamilication in various social metaverse and desktop engines. KZ 3 BI-VWM.21 Searching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction form web pages. They get detailed knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is to cased on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to tack students modern humanoid robot control and development of splications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development to is. In labs, students program as of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modeling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in t	The course locus		nputational trimking	, empairiy			
Continuation of the course Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objective is to develop applications for computer science and gamification in various social metaverse and desktop engines. BI-VWM.21 Searching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in text and hypertext documents (the web page sthemselves) and about feature extraction from web pages. They get detailed knowledge of similarity search in multimedia databases (generally in collections of unstructivered data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent exhology endedded System Fundamentals of motion control, sensor reading, application in terfaces, robot navigation and development of applications in a graphical development environment. Ledures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information constructions for understanding formal principles of process modelling and they suill learn basics of substime the field of automatic control. Sudents will gain knowledge in this rapidy evolving field of great future. We will focus our attention particularly on a netherprise. BI-ZRS.21 Basics of S	BL-V/P2		K7	3			
bit voltage Searching the Web and Multimedia Databases Z,ZK 5 bit voltage tasic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students acquire information about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from web pages. They get detailed knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and evelopment of application in a graphical development environment. Lectures provide fundamentals of monocors or reading, application interfaces, robot navigation and development tools. In labs, students will get necessary foundations for understanding formal principles of process modelling and they will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding of business processes using modern CASE tools. The role of process engineering in this subject. Students will gain knowledge in this rapidly evolving field of great future. We will focus our and business strategy of an enterprise. BI-ZPI Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field				-			
BI-VWM.21 Searching the Web and Multimedia Databases Z,ZK 5 Students get basic overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage of documents. In particular, students acquire information about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from web pages. They get detailed knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and development to applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program as of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process endelling and they will learn basics of the used notations (UML, BPMN, BORN). The focus in this subject lies in training of practical skills of formalisation and modelling of business strategy of an enterprise. BI-ZRS.21							
Students get basic overview about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from web pages. They get detailed knowledge of similarity search in multimedia databases (generally in collectors of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical as lis importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus out atention particularly on control of engineering and phys	BI-VWM.21		Z.7K	5			
knowledge of similarity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web search engines for the mentioned data types (documents). BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus or attention particularly on control of engineering and physical systems. We will provide basic information from the feedback, control of linear dynamical SISO systems, description of the system models, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors an actuators in control loops, issues of stability in cont							
data types (documents). Intelligent embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is to cased on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern cASE tools. The role of process engineering for information systems development to is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidy evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information ngiple PID feedback, PSD, and fuzzy control estimate as description methods of system models, basic linear dynamic systems analysis and design verificati							
BI-ZIVS Intelligent Embedded System Fundamentals KZ 4 Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and development of applications in a graphical development revironment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information information and simple PID feedback, PSD, and fuzzy controllers. Attention is also give to sensors and actuators in control lops, issues of stability in control systems, single and continuous adjustment of the control. Z 10 BI-ZRS.21 Basicco of System Control	knowledge of simila	rity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web se	arch engines for the	mentioned			
Intelligent embedded system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the course is to teach students modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. Single and continuous adjustment of the controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of		data types (documents).					
modern humanoid robot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous adjustment of the controller parameters.		6	I I				
Interfaces, robot navigation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get practical experience with these technologies. BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within	-						
technologies. KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship Auxillary courses BI-ZS10, BI-ZS20, BI-ZS			, 0,				
BI-ZPI Process engineering KZ 4 Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will gain to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. Z 10 Bachstudent can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship Auxiliary courses BI-ZS10, BI-ZS20, BI	interfaces, robot na		practical experience	with these			
Students will learn fundamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of process modelling and they will learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. B	DI 701	-	1/7				
learn basics of the used notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business processes using modern CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of t		o o	1 1				
CASE tools. The role of process engineering for information systems development is discussed as well as its importance in the overall context of information and business strategy of an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS20 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of fu			•				
an enterprise. BI-ZRS.21 Basics of System Control Z,ZK 5 The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. Z 10 BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can b			-	-			
BI-ZRS.21Basics of System ControlZ,ZK5The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control.BI-ZS10Bachelor internship abroad for 10 creditsZ10Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	CAGE 10013. The ft			strategy of			
The course gives an introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus our attention particularly on control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	BI-7RS 21		7 7K	5			
control of engineering and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description methods of system models, basic linear dynamic systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship							
model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	-		-	-			
control loops, issues of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial implementation of continuous and digital controllers and PLC control. BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	•						
BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	model, the basic	linear dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also giver	to sensors and ac	tuators in			
BI-ZS10 Bachelor internship abroad for 10 credits Z 10 Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	control loops, issu		implementation of	continuous			
Each student can once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship							
internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship			1 1				
internship. Auxiliary courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship							
employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship	-						
			-				
	employment with a	-		= memsnip			

BI-ZS20	Bachelor internship abroad for 20 credits	Z	20				
	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or re						
internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the							
	courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits con foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided int	-					
	exceeds the academic year's dead-line.	-	-				
BI-ZS30	Bachelor internship abroad for 30 credits	Z	30				
	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or re						
	an of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professic r courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corr						
	foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided int	-					
	exceeds the academic year's dead-line.	-	-				
BI-ZSB.21	Basics of System Security	Z,ZK	5				
-	burse is to provide introduction to basic concepts in security of computer systems. Further, the course introduces the basics of forens	-	-				
	analysis or incident response. After finishing the course student will get both theoretical and practical knowledge in the area of moder as well as skills needed for independent work in the area of operating system security incident analysis.	n operating system	is security,				
BI-ZUM.21	Artificial Intelligence Fundamentals	Z,ZK	5				
	roduction to artificial intelligence with emphasis on symbolic techniques. The design of an intelligent agent and the techniques neede		-				
especially at the d	lecision-making level. The intelligent agent in the context of the course can be represented for example by a physical robot, but also be	oy a non-physical e	entity, such				
as a v	virtual assistant or a character in a computer game. We will not only introduce the basics, but also show the current state-of-the-art d	uring the course.					
BI-ZWU	Introduction to Web and User Interfaces	Z,ZK	4				
	This course is presented in Czech.						
BIE-CSI	Introduction to Computer Science	Z	2				
This is an introducto	ory class on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other fit	elds but interested	in computer				
	ool students, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The go						
	rinciples of computer science for students to understand, early on, what computer science is, why things such as high-level programmed and the state of the state						
	are, and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer no						
questions but also	questions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are interest	sted in computer so	cience more				
	than expected, or even less than before.						
BIE-DIF	Differential equations	Z,ZK	5				
	is a foundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essential so		-				
-	heorems on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered wit						
	sis, followed by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world application	-					
partial differential	equations (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODEs	and PDEs, includi	ing 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				
The BIE-ECC cours	se can be recognized for any active semester after the submission of a certificate certificate that demonstrates their proficiency in Engli	sh comparable to c	r exceeding				
	the B2 level of the Common European Framework of Reference for Languages.						
BIE-IMA2	Introduction to Mathematics 2	Z	2				
Students refresh ar	nd extend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are a	able to apply them	in particular				
	examples.						
BIE-SEG	Systems Engineering	Z	0				
This is an introduct	ory class on systems engineering for bachelor students in computer science. The goal of the class is to introduce basic principles of (operating systems	for students				
to understand proc	essor and memory virtualization. Seeing and actually understanding virtualization is the overarching theme of the class. After taking	the class, students	are able to				
understand the o	difference between processes and threads as well as emulation and virtualization, what virtual memory is and how it works, what cor	ncurrency is, as op	posed to				
	parallelism, and how processes and threads synchronize efficiently to overcome concurrency for communication.						
FI-TOP	Academic writing	Z	2				
Publishing is an imp	oortant and required part of research activity. It is not only about obtaining research results but also about applying them in the form o	of publication. Writi	ng scientific				
publications can be	e useful for students not only in their own publishing activities but also in the preparation of a bachelor's or master's thesis. In the cou	rse, students will le	earn how to				
write a scientific arti	icle, what parts such an article should have, and how the peer review process works. Students will also try their hand at presenting an	article and reviewir	ng someone				
else's article. The o	course will be taught in blocks, with one lecture at the beginning of the semester and one practicum in the middle of the semester. Da	ates will be determ	ined based				
	on the availability of enrolled students.						
FIT-ITI	Modern IT infrastructure	Z,ZK	5				
FIT-SEP			4				
-		Z.ZK	4				
This course is pres	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by c	Z,ZK omparing individua					
	World Economy and Business	omparing individua	I countries				
and key regions of v	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by co	omparing individua indexes of econom	I countries nic freedom,				
and key regions of v	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by c world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as	omparing individua indexes of econom	I countries nic freedom,				
and key regions of v	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by co world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of di readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite.	omparing individua indexes of econom	I countries nic freedom,				
and key regions of v corruption and ecor FITE-EHD	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by co world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of di	omparing individua indexes of econom scussions based c Z,ZK	I countries hic freedom, hin individual				
and key regions of v corruption and ecor FITE-EHD The course introdu	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by co world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of di readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History	omparing individua indexes of econon scussions based c Z,ZK nomy through the	l countries nic freedom, on individual 3 description				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by co world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of di readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History uces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global eco	omparing individua indexes of econon scussions based of Z,ZK nomy through the history. From large	l countries nic freedom, on individual 3 description e economic				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Em	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convorted economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of directions. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History uces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered.	I countries nic freedom, on individual 3 description e economic The course				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Em	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convorted economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History uces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institution	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered.	I countries nic freedom, on individual 3 description e economic The course				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Em	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convorted economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History access a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutions and cultures but rather the impact of trade and role of particular events, institutions and countries but rather the impact of trade and role of particular events, institutions and countries but rather the impact of trade and role of particular events.	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered.	I countries nic freedom, on individual 3 description e economic The course				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Emp does not cover de	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History aces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutitailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and current give will consist of a mixture of lecture and discussion.	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ	I countries nic freedom, n individual description e economic The course tory. Class				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Emp does not cover de NI-AFP This course is prese	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History aces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutitailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and current affairs, we development of modern financial institutions and current affairs. Applied Functional Programming	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ rogramming langu	I countries nic freedom, on individual description e economic The course tory. Class 5 ages are on				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Emp does not cover de NI-AFP This course is prese	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History aces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutitailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and current get will consist of a mixture of lecture and discussion. Applied Functional Programming ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming paradigms.	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ rogramming langu	I countries nic freedom, on individual description e economic The course tory. Class 5 ages are on				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Emp does not cover de NI-AFP This course is prese	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History aces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutitailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and current get will consist of a mixture of lecture and discussion. Applied Functional Programming ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ rogramming langu	I countries nic freedom, on individual description e economic The course tory. Class 5 ages are on				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Em does not cover de NI-AFP This course is press the rise nowadays	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History aces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial instituti tailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and commetings will consist of a mixture of lecture and discussion. Applied Functional Programming ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master necessary competence of a software engineer: the theory and especially the practice.	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ rogramming langu ing this paradigm l	I countries nic freedom, n individual 3 description e economic The course tory. Class 5 ages are on becomes a 4				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Em does not cover de <u>NI-AFP</u> This course is prese the rise nowadays <u>NI-DDM</u> Course focuses on	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History uces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial instituti tailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and comeetings will consist of a mixture of lecture and discussion. Applied Functional Programming ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master necessary competence of a software engineer: the theory and especially the practice.	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ rogramming langu ing this paradigm l KZ on experience with	I countries nic freedom, n individual 3 description e economic The course tory. Class 5 ages are on becomes a 4 large scale				
and key regions of v corruption and ecor FITE-EHD The course introdu of the key periods area of Roman Em does not cover de <u>NI-AFP</u> This course is prese the rise nowadays <u>NI-DDM</u> Course focuses on	World Economy and Business sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by convold economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of direadings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Introduction to European Economic History uces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economic history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial instituti tailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and current affairs, the development of modern financial instituti tailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and current affairs, the development of modern financial institutions and current affairs and the functional programming represents one of the traditional programming ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master necessary competence of a software engineer: the theory and especially the practice. Distributed Data Mining	omparing individua indexes of econom scussions based of Z,ZK nomy through the history. From large ons is deciphered. organizations in his KZ rogramming langu ing this paradigm l KZ on experience with	I countries nic freedom, n individual description e economic The course tory. Class 5 ages are on becomes a 4 large scale				

NI-DSP	Database Systems in Practes	Z,ZK	4					
NII 070	This course is presented in Czech.	7 71/	4					
NI-DZO Digital Image Processing Z,ZK 4								
This course presents a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical algorithms that are both easy to implement and have an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is also valuable outside the domain								
of digital image processing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR compression, de-blurring in								
frequency domain, abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray conversion, context enhancement,								
	gid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, ac		-					
NI-IAM	Internet and Multimedia se is focused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes acq	Z,ZK	4 Is (input)					
	signals (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practical u	-						
audiovisual transn	nissions. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the effe	ect of various comp	onents on					
the quality and late	ncy of AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recording the	e scene up to the p	resentation					
NI-LSM	for audience. Statistical Modelling Lab	ΚZ	5					
	ented on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is p		-					
	on and its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, and							
	At this point, the subject is on the border of own research and may result in the topic of final work (diploma or bachelor thesi							
NI-MOP	Modern Object-Oriented Programming in Pharo	KZ	4					
	gramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills	-						
	in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development no							
	ing object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work of							
-	ms of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involver							
NI-MPL	Managerial Psychology	ZK	2					
NI-MSI	Mathematical Structures in Computer Science	Z,ZK	4					
Mathematical se	emantics of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scott Introduction to category theory.	model of lambda	calculus.					
NI-OLI	Linux Drivers	Z,ZK	4					
	g system is an important operating system for personal computer and also for embedded systems. Systems on chip and combining po							
	ability of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver development		ents. The					
	urse provides knowledge of Linux operating system architecture, principles of development of various types drivers, including practication							
NI-PDD Students learn to p	Data Preprocessing repare raw data for further processing and analysis. They learn what algorithms can be used to extract information from various data s	Z,ZK	5 ages texts					
	and learn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction of characteris							
	pages.	0						
NI-PSD	Public Services Design	KZ	4					
	oduce students to specifics of UX, Service design and development for public sector. We will look into the design and development p nd designesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration	-						
Suppliers (devs a	Course is aimed at students-designers as well as clients.	r with client repres	entatives.					
NI-PSL	Programming in Scala	Z,ZK	4					
	uces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language feature							
advance standard l	brary. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks and Scalaz, etc.	l libraries e.g. Play,	Cassandra,					
NI-REV	Reverse Engineering	Z,ZK	5					
	equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens before							
	will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is dedicated							
	ten in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be de							
debuggers and de	bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer the course is on the seminars, where students will solve practically oriented tasks from the real world.	maiware scene. If	le locus of					
NI-SYP	Parsing and Compilers	Z,ZK	5					
	upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of va							
	of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.							
NI-TSP	Testing and Reliability	Z,ZK	5					
-	knowledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to prepensitization and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with bu							
	will be able to compute, analyze, and control the reliability and availability of the designed circuits.		inona moy					
NI-VCC	Virtualization and Cloud Computing	Z,ZK	5					
-	n knowledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and	-						
acquainted with virtualization principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficiently operate and optimize the								
performance parameters of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective technology today for the management of complex computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skills in the use of modern integration								
and development tools (Continuous integration and development).								
NI-VYC	Computability	Z,ZK	4					
	Classical theory of recursive functions and effective computability.							
TV1	Physical Education	Z	0					
TV2	Physical Education	Z	0					
TVK1	Physical Education	Z	1					
TVKLV TVKZV	Physical Education Course Physical Education Course	Z Z	0					
TVKZV	Physical Education Course Physical education	Z	0					
1 1 1 1	i iiyoldi Euulaliuli	۷	U					

Ζ

0

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-06-14, time 17:52.