Study plan

Name of study plan: Bachelor Specialization Computer Graphics, in Czech, 2024

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: 158
Elective courses credits: 22
Sum of credits in the plan: 180

Note on the plan: Tato verze studijního plánu je ur ena pro ro níky, které byly p ijaty ke studiu od akademického roku 2024/2025 do prezen ní formy studia bakalá ského programu. . 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. 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 (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, Róbert Lórencz, Julia Plotnikova, David Pokorný, Jakub Tetera 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.)	KZ	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.)	KZ	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 basics of efficient algorithm design, data structures, and graph theory, belonging to the core knowledge of every computing curriculum. It links and partially develops the knowledge from the course BI-DML.21, in which students acquire the knowledge and skills in combinatorics necessary for evaluating the 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 notation.

BI-AAG.21 Automata and Grammars

Students are introduced to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite automata, regular expressions, and regular grammars, context-free grammars, construction and use of pushdown automata, and translation grammars and transducers. They know the hierarchy of formal languages

 BI-BAP.21
 Bachelor Thesis
 Z
 14

 BI-BPR.21
 Bachelor project
 Z
 1

and they understand the relationships between formal languages and automata. They are introduced to the Turing machine and complexity classes P and NP.

1. At the beginning of the semester, the student reserves the topic of the bachelor's thesis and connects with the supervisor. He / she will arrange the partial tasks that he / she will perform during 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 end of the semester. 2. The external supervisor enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut.cz/student/studijni/formulare). The completed and 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 topic of the work that the student has reserved is formulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assignment so that the assignment can be supplemented and 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 learn to design small databases (including integrity constraints) using a conceptual model and implement them in a relational database engine. They get a hands-on experience with the SQL language, as well as with its theoretical foundation - the relational database model. They learn the principles of normalizing a relational database schema. They understand the fundamental concepts of transaction processing, controlling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced to special ways of storing data in relational databases with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of database systems, debugging and optimizing database applications, distributed database systems, data stores.

BI-DML.21 Discrete Mathematics and Logic Z,ZK

Students will get acquainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts from set theory will be explained. Special attention is paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The course also lays down the basics of combinatorics and number theory, with emphasis on modular arithmetics.

BI-KAB.21 Cryptography and Security Z,ZK 5

Students will understand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to use cryptographic keys and certificates in systems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in applications. Within labs, students will gain practical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procedures of cryptanalysis.

BI-LA1.21 Linear Algebra 1 Z.ZK 5

We will introduce students to the basic concepts of linear algebra, such as vectors, matrices, vector spaces. We will define vector spaces over the field of real and complex numbers and also over finite fields. We will present the concepts of basis and dimension and learn to solve systems of linear equations using the Gaussian elimination method (GEM) and show the connection with linear manifolds. We define the regularity of matrices and learn to find their inversions using GEM. We will also learn to find eigenvalues and eigenvectors of a matrix. We will also demonstrate some applications of these concepts in computer science.

BI-MA1.21 Mathematical Analysis 1 We begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers. Then we study real sequences and real functions of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This theoretical foundation is then applied to root-finding problems (iterative method of bisection and Newtons method), construction of cubic interpolation (spline), and formulation and solution of simple optimization problems (i.e., the issue of finding extrema of functions). The course is closed with the Landaus asymptotic notation and methods of mathematical description of complexity of algorithms. Mathematical Analysis 2 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 learn how to integrate by parts and use the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylors theorem to the computation of elementary functions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Master theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the analytical method of localization of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of multivariate functions. BI-OSY.21 Operating Systems In this course that is a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementations, race conditions, critical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BI-PSI.21 Computer Networks The course introduces students to the principles of computer networking. It covers basic technologies, protocols, and services commonly used in local networks and in the Internet as well. The lectures will be amended by proseminars that introduce students into network programming and demonstrate the abilities of advanced network technologies. Students practically verify configurations and management of network devices in the lab within the environment of the operating systems Linux and Cisco IOS. **Probability and Statistics** Students will learn the basics of probabilistic thinking, the ability to synthesize prior and posterior information and learn to work with random variables. They will be able to apply basic models of random variable distributions and solve applied probabilistic problems in informatics and computer science. Using the statistical induction they will be able to perform estimations of unknown distributional parameters from random sample characteristics. They will also be introduced to the methods for testing statistical hypotheses and determining the statistical dependence of two or more random variables. Programming and Algorithmics 1 Students gain the ability to formulate algorithms for solving basic problems and write them in the C language. They understand data types (simple, structured, pointers), expressions, statements, functions, concept of recursion. They learn to analyse simple cases of algorithm complexity. They know fundamental algorithms for searching, sorting, and manipulating with linked lists and trees BI-PA2.21 Programming and Algorithmics 2 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, set, table). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). Computer Structure and Architecture Students will get acquainted with the basic architecture and units of a digital computer, understand the structure, function, and implementation of arithmetic-logic unit, controllers, memory, I/O communication, methods of data transfers between the units. The logic design and the implementation of a program-controlled simple processor is practically implemented in the labs using programmable circuits (FPGA), a single-chip microcomputer, and modern design (EDA) tools. Technological Fundamentals of Computers Students get acquainted with the fundamentals of digital and analog circuits, as well as basic methods of analyzing them. Students learn how computer structures look like at the lowest level. They are introduced to the function of a transistor. They will understand why processors generate heat, why cooling is necessary, and how to reduce the consumption; what the limits to the maximum operating frequency are and how to raise them; why a computer bus needs to be terminated, what happens if it is not; how a computer power supply looks like (in principle). In the labs, students model the behavior of basic electrical circuits in SW Mathematica. BI-GIT.21 **SW Development Technologies** 3 This course is aimed at one of the rudimental team software development technology - version control. To be more specific, we will introduce students to Git, the information 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** ΚZ 3 The course is focused on the basics of creating electronic documentation with emphasis on the creation of technical reports of a larger scope, typically final university theses. Students exercises of the course, an active approach to the creation of individual parts of the bachelor's thesis is assumed.

learn to create text of a technical report in the LaTeX system, process an electronic presentation using the LaTeX Beamer system, and practically present it in front of classmates and the teacher. The course is intended primarily for those students who have chosen the topic of their bachelor's thesis or will choose it within the first 14 days of teaching. Within the

Unix-like Operating Systems

Unix-like operating systems represent a large family mostly open-source codes that kept bringing during the history of computers efficient innovative functions of multiuser operating systems for computers and their networks and clusters. The most popular OS today, Android, has a unix kernel. Students get overview of basic properties of this OS family, such as processes and threads, access rights and user identity, filters, or handling files in a file system. They learn to use practically these systems at the level of advanced users who are not only able to utilize powerful system tools that are available to users, but are also able to automatize routine agenda using the unix scripting interface, called shell.

Name of the block: Compulsory courses in the specialization

Minimal number of credits of the block: 45

The role of the block: PS

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

Name of the group: Compulsory Courses of Specialization Computer Graphics, version 2021

Requirement credits in the group: In this group you have to gain 45 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 45 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-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 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-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	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.21 Name=Compulsory Courses of Specialization Computer Graphics, version 2021

BI-LA2.21 Z,ZK Linear Algebra 2 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 prostor v abstraktní 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 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. Ukážeme si také aplikace lineární algebry v r zných oborech.

BI-MVT.21 Modern Visualisation Technologies

Z,ZK

The goal of the course is to give an overview of modern visualization technologies and their principles, namely technologies related to virtual and augmented reality, visualization on high resolution displays (e.g., SAGE and video mapping) and their applications in practice. Several lectures deal with the content creation for the mentioned technologies, 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 working with images, 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, and compression technologies. They learn to use multimedia transmission and representation systems, including real-time multimedia processing. They understand the principle of operation 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

After attending this curse, students can program a simple interactive 3D graphical application like a computer game or scientific visualization, design the scene, add textures 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 terms used in computer graphics, such as graphical pipeline, geometric transformations, or lighting model. They gain knowledge allowing orientation in computer graphics and representing solid fundamentals for your professional development, e.g., GPU programming and animations. They get used to techniques utilized in geometric modeling, modeling curves and surfaces, and scientific visualization.

Programming of Graphic Applications

The course will present the possibilities of current professional open-source tools for image editing, video editing, 3D animation (GIMP, Blender) and their use for visualization of specific data (3D scenes, mathematical data). Emphasis will be placed on the possibilities of further enhancement of the presented software tools, both using built-in scripting languages and by implementation of plugins.

BI-PYT.21 Python Programming

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 processing. The differences between philosophy of programming in Python and in other programming languages will be explained. Each topic is prepared for students in the format of a Jupyter notebook, 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 semester work will be assigned during the semester.

BI-SWI.21 Software Engineering

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 hands-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 design and testing. Within 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-SV7 21 Machine vision and image processing

Z,ZK

Camera systems are becoming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluate image information. The course introduces students to different types of camera systems and a variety of methods for image and video processing. The course is focused on practical use of camera systems for solving problems of practice that the graduates may encounter.

BI-TUR.21 User Interface Design

Z,ZK

Students gain a basic overview of methods for designing and testing common user interfaces. They get experience to solve the problems where software and other products do not communicate with the user optimally, since the needs and characteristics of users are not taken into account during product development. Students gain an overview of methods that bring users into the development process to ensure optimal interface for them.

Name of the block: Compulsory elective 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.)	KZ	5	2C	Z	PV
BI-VHS.21	Virtual game worlds 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
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-up, the functionality, testing, and documentation of the software system being developed will be emphasized. Students will work in teams of 4-6 people. The teacher, in the role of the team and project leader, regularly consults with the team (at the seminars) the formal as well as material aspects of their solution.

BI-VHS.21 | Virtual game worlds | Z,ZK | 5 In the course students learn methods to create a complex virtual world. It is a follow-up course of basic courses of the PG specialization (BIE-MGA, BIE-PGR). Students gain knowledge of the theory of game design, of principles of writing dialogues and characters in order to create a functional virtual world. Within the labs they get practical skills within team development work on the semester project.

Name of the block: Povinná t lesná výchova, sportovní kurzy

Minimal number of credits of the block: 0

The role of the block: PT

Code of the group: BI-PT.24

Name of the group: Physical Education, version 2024

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 2 courses (at most 7)

Credits in the group: 0

Note on the group:

The student is obliged to successfully complete two courses of this 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
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 í 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

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

Onal actoristic	33 of the courses of this group of olday fram. Code-bit 1.24 Name-1 mysical Education, versic	/// ZUZ-T	
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.

--

br> BI-ANG1, ending with an exam for two credits, is enrolled 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 (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 ing Valentová Kate ing 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 ca	The BIE-ECC course can be recognized for any active semester after the submission of a certificate that demonstrates their proficiency in English comparable to or exceeding						
the B2 level of the Com	mon European Framework of Reference for Languages.						
BI-ANG	English Language, Internal Certificate	ZK	2				
Course information and	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

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 (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 (Gar.)	Z	2	2C	L	V
BI-APJ	Aplication Programming in Java Ji í Dan ek	Z,ZK	4	2P+1R+1C	Z	V
NI-AFP	Applied Functional Programming Robert Pergl, Marek Suchánek, Daniel N mec Robert Pergl Robert Pergl (Gar.)	KZ	5	2P+1C	L	V
BIE-ZUM	Artificial Intelligence Fundamentals Pavel Surynek	Z,ZK	4	2P+2C	L	V

BI-BLE	Blender	Z,ZK	4	2P+2C	L	V
NI-DSP	Lukáš Ba inka Lukáš Ba inka Lukáš Ba inka (Gar.) Database Systems in Practes	Z,ZK	4	2P+1C	 	V
BI-STO	Tomáš Vichta Tomáš Vichta Tomáš Vichta (Gar.) Storage and Filesystems	Z,ZK	4	2P+2C	L,Z	V
NI-PSD	Public Services Design	KZ	4	1P+2C	۷,۷	V
BIE-DIF	David Pešek, Ond ej Brém David Pešek Ond ej Brém (Gar.) 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 (Gar.)	Z	2	2C	Z,L	V
BI-EJA	Enterprise Java Ji í Dan ek	Z,ZK	4	2P+2C	L	V
BI-EJK	Enterprise Java and Kotlin Ji Dan ek Ji í Dan ek Ji í Dan ek (Gar.)	Z,ZK	4	2P+2C	L	V
BI-FMU	Financial and Management Accounting David Buchtela	Z,ZK	5	2P+2C	Z	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 (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 Ji í Melnikov	Z,ZK	4	2P+1C	L	V
BIE-CSI	Introduction to Computer Science Christoph Kirsch Christoph Kirsch (Gar.)	Z	2	2C	Z	V
BIE-IMA2	Introduction to Mathematics 2 Karel Klouda	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 (Gar.)	KZ	4	3C	L	V
BI-QAP	Quantum algorithms and programming Tomáš Kalvoda, Ivo Petr Ivo Petr (Gar.)	KZ	5	1P+2C	Z	V
NI-LSM	Statistical Modelling Lab 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 (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 (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-MIT	Mikrotik technologies Jan Fesl Jan Fesl (Gar.)	KZ	3	1P+2C	Z	V
NI-MOP	Modern Object-Oriented Programming in Pharo Jan Blizni enko Robert Pergl Robert Pergl (Gar.)	KZ	4	3C	Z	V
BI-MVT.21	Modern Visualisation Technologies Ji í Chludil, Petr Pauš Petr Pauš (Gar.)	Z,ZK	5	2P+2C	Z	V
BI-MMP	Multimedia team project Zde ka echová Zde ka echová (Gar.)	KZ	4	3C	Z,L	V
BI-ORL	Operations Research and Linear Programming Dušan Knop Dušan Knop Dušan Knop (Gar.)	KZ	5	1P+2C	L	V
NI-OLI	Linux Drivers Miroslav Skrbek, Jaroslav Borecký Jaroslav Borecký Miroslav Skrbek (Gar.)	Z,ZK	4	2P+2C	L	V
BI-ACM	Programming Practices 1 Tomáš Valla Tomáš Valla (Gar.)	KZ	5	4C	L	V
BI-ACM2	Programming Practices 2 Ond ej Suchý, Tomáš Valla Tomáš Valla (Gar.)	KZ	5	4C	Z	V
BI-ACM3	Programming Practices 3 Ond ej Suchý, Tomáš Valla Tomáš Valla (Gar.)	KZ	5	4C	L	V
BI-ACM4	Programming Practices 4 Ond ej Suchý, Tomáš Valla Tomáš Valla Ond ej Suchý (Gar.)	KZ	5	4C	Z	V

BI-AND.21	Programming for the Android Operating System Jan Mottl, Jan Vep ek, Marek Kodr, Petr Šíma Jan Mottl Marek Kodr (Gar.)	KZ	4	3C	L	V
BI-CS1	Programming in C# Pavel Št pán, Helena Wallenfelsová Helena Wallenfelsová Pavel Št pán (Gar.)	KZ	4	3C	L,Z	V
BI-PJV	Programming 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-PJS.1	JavaScript Programming Old ich Malec	KZ	4	3C	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 Jií Dan ek Jií 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-PHP.1	Programing in PHP	KZ	4	3C	Z	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
BI-PKM	Marcel Ji ina Marcel Ji ina Marcel Ji ina (Gar.) Introduction to mathematics	Z	4		Z	V
NI-REV	Tomáš Kalvoda Tomáš Kalvoda (Gar.) Reverse Engineering	Z,ZK	5	1P+2C	Z	V
BI-SCE1	Josef Kokeš Josef Kokeš Josef Kokeš (Gar.) Computer Engineering Seminar I	Z	4	2C	L,Z	V
BI-SCE2	Hana Kubátová Hana Kubátová Hana Kubátová (Gar.) Computer Engineering Seminar II	Z		2C	·	
	Hana Kubátová Hana Kubátová Hana Kubátová (Gar.) Network Technology 1		4		L,Z	V
BI-ST1	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 Alexandru Moucha Alexandru Moucha (Gar.)	Z	3	2C	L	V
BI-SKJ.21	Scripting Languages Lukáš Ba inka, Jan Ž árek Lukáš Ba inka Jan Ž árek (Gar.)	Z,ZK	4	2+2	L	V
BI-SOJ	Machine Oriented Languages	Z,ZK	4	2P+2C	L	V
BI-SEP	World Economy and Business 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
BI-GIT	Version control system GIT Petr Pulc	KZ	2	16P	Z,L	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
TV2K1	Physical Education 2	Z	1		L,Z	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	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
BI-TDA	Ond ej Suchý, Tomáš Valla Tomáš Valla (Gar.) Test driven architecture	KZ	4	2P+1C	Z,L	V
NI-TSP	Marek Hakala Testing and Reliability Petr Fišer Martin Da hel Petr Fišer (Gar.)	Z,ZK	5	2P+2C	Z	V
INI-IOF		-,	1 -		_	1 .

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 Petr Olšák Petr Olšák Petr Olšák (Gar.)	Z,ZK	4	2P+1C	L	V
BI-EHD	Introduction to European Economic History Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)	Z,ZK	3	2P+1C	Z,L	V
BI-KSA	Cultural and Social Anthropology 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 Ž árek Zden k Muziká Zden k Muziká (Gar.)	Z	2	4D	Z	V
BI-OPT	Introduction to Optical Networks Pavel Tvrdík	Z,ZK	4	2P+1C	Z	٧
NI-VCC	Virtualization and Cloud Computing Tomáš Vondra, Jan Fesl Tomáš Vondra Tomáš Vondra (Gar.)	Z,ZK	5	2P+1C	L	V
BI-VHS	Virtual game worlds Radek Richtr	ZK	4	2P+2C	Z	V
BI-VR1	Virtual reality I Petr Pauš, Petr Klán Petr Klán (Gar.)	KZ	4	2P+2C	L,Z	V
BI-VR2	Virtual reality II Petr Klán Petr Klán Petr Klán (Gar.)	KZ	3	1P+2C	L	V
BI-VAK.21	Selected Applications of Combinatorics Michal Opler Michal Opler Michal Opler (Gar.)	Z	3	2R	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 Star ý 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 (Gar.)	KZ	4	1P+3C	Z	V
BI-ZPI	Process engineering Robert Pergl Robert Pergl Robert Pergl (Gar.)	KZ	4	1P+2C	L	V
BI-ZNF	PHP Framework Nette - basics Ji í Chludil	KZ	3	2P+1C	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

Informatics, ve	ersion from 2021/22 till 2024/25		
BI-MVT.21	Modern Visualisation Technologies	Z,ZK	5
The goal of the co	ourse is to give an overview of modern visualization technologies and their principles, namely technologie	es related to virtual and augmented reality, vi	sualization on
	splays (e.g., SAGE and video mapping) and their applications in practice. Several lectures deal with the cor	ntent creation for the mentioned technologies	, namely fractal
and procedural vis	sualization, 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
This course is pres	esented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	·	
BI-ALO	Algebra and Logic	Z,ZK	4
The course extend	ds and deepens the study of topics touched upon in the basic course in logic.	· ·	
BI-AVI.21	Algorithms visually	Z,ZK	4
The course comple	lements other algorithm courses at FIT. It brings knowledge about particular important algorithms from diffe	erent fields of the computer science that exter	nd substantially
knowledge present	ited in BI-AG1 and BI-AG2. A wide scope of covered subject is made possible due to using visualization bz Alg	ovision (www.algovision.org <http: td="" www.alg<=""><td>ovision.org>)</td></http:>	ovision.org>)

that make understanding the principles of algorithms easy.

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 Achievements active part in the language instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both		
tests with the success rate set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by		
class of the term.	marrada todono.	o daming the mot
BI-APJ Aplication Programming in Java	Z,ZK	4
This course is presented in Czech. Advanced technologies in Java.	_,_,	•
NI-AFP Applied Functional Programming	KZ	5
This course is presented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel function	1	_
the rise nowadays and the functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, mas		
necessary competence of a software engineer: the theory and especially the practice.		
BIE-ZUM Artificial Intelligence Fundamentals	Z,ZK	4
Students are introduced to the fundamental problems in the Artificial Intelligence, and the basic methods for their solving. It focuses mainly on the class	ssical tasks from th	ne areas of state
space search, multi-agent systems, game theory, planning, and machine learning. Modern soft-computing methods, including the evolutionary algorithms are spaced as a comparison of the computing methods.	ithms and the neur	al networks, will
be presented as well.		
BI-BLE Blender	Z,ZK	4
The course extends knowledge of opensource program Blender from Bl-MGA (Multimedia and Graphics Applications) course. It is intended for those animation. It offers a complete and practically oriented introduction to Blender environment. Students may continue to Bl-PGA (Programming graphi		
		4
NI-DSP Database Systems in Practes This course is presented in Czech.	Z,ZK	4
BI-STO Storage and Filesystems	Z,ZK	4
The student will learn principles and current solutions of storage systems architecture. The module explains principles of data store, protection, and a	1 ' 1	
load balancing and high availability.	archiving, as so as	storage scaling,
NI-PSD Public Services Design	KZ	4
The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and developme		•
suppliers (devs and designesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaborations	•	
Course is aimed at students-designers as well as clients.		
BIE-DIF Differential equations	Z,ZK	5
This course provides a foundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essenti	al solution method	s like separation
of variables. Key theorems on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered		
polynomial analysis, followed by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world applicati	-	
partial differential equations (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving OD	Es and PDEs, incl	uding implicit
and explicit Euler methods, Runge-Kutta methods, and finite element methods for both ODEs and PDEs.	7.71	4
NI-DZO Digital Image Processing This source process a comprehensive everyion of modern methods for interactive editing of digital images and video. It mainly deals with practical	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 implement and have an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that i	-	-
of digital image processing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDF		
frequency domain, abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray of	•	-
interactive as-rigid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, a		t crimariocriticiti,
	dding depth, alpha	
NI-DDM Distributed Data Mining	KZ	
NI-DDM Distributed Data Mining Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand	KZ	a matting.
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation	KZ ds on experience	4 matting scale
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain han data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language.	KZ ds on experience was and will be capa	a matting. 4 with large scale able to propose
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24 Effective programming 1	KZ ds on experience	4 matting scale
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24 Effective programming 1 The course is taught in Czech.	KZ ds on experience was and will be capa	a matting. 4 with large scale able to propose
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capa KZ	a matting. 4 with large scale able to propose 4
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capa KZ	a matting. 4 with large scale able to propose 4
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24 Effective programming 1 The course is taught in Czech. BI-EP2 Efficient Programming 2 Continuation of Efficient Programming 1. Students will practice implementation of algorithms by solving typical problems. Various ways of solving with the aim to choose the best one and avoid implementation errors.	KZ ds on experience on sand will be capa KZ KZ KZ ividual problems a	a matting. 4 with large scale able to propose 4 4 4 are discussed,
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	kZ ds on experience was and will be capa KZ KZ dividual problems a	a matting. 4 with large scale able to propose 4 4 are discussed,
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capa KZ KZ KZ kividual problems a	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capa KZ KZ ds on experience on an and will be capa KZ dividual problems and an analysis and an a	a matting. 4 with large scale lible to propose 4 4 4 are discussed, 2 due to: -Take an the final term
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capa KZ KZ ds on experience on an and will be capa KZ dividual problems and an analysis and an a	a matting. 4 with large scale lible to propose 4 4 4 are discussed, 2 due to: -Take an the final term
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capa KZ KZ dividual problems a Z ent - students are on the midterm and individual teacher	a matting. 4 with large scale lible to propose 4 4 4 are discussed, 2 due to: -Take an the final term
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capa KZ KZ dividual problems a Z ent - students are on the midterm and individual teacher Z,ZK	a matting. 4 with large scale lible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capa KZ KZ dividual problems a Z ent - students are on the midterm and individual teacher Z,ZK	a matting. 4 with large scale lible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capa KZ KZ dividual problems a Z ent - students are on the midterm and individual teacher Z,ZK	a matting. 4 with large scale lible to propose 4 4 4 are discussed, 2 due to: -Take an the final term is during the first
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capa KZ KZ dividual problems a sent - students are on the midterm and individual teacher Z,ZK systems which ar Z,ZK	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capa KZ KZ dividual problems a sent - students are on the midterm and individual teacher Z,ZK systems which ar Z,ZK	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capa KZ KZ dividual problems a Z ent - students are on the midterm and individual teacher Z,ZK systems which ar Z,ZK rmation systems w	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 ith microservice
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capate of the midterm and individual teacher Z,ZK systems which ar Z,ZK rmation systems we approximation systems we approximation systems we approximation account.	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 tith microservice 5 ting operations,
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain handata processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capate of the midterm and individual teacher Z,ZK systems which ar Z,ZK rmation systems w E,ZZK e particular accouration of bookkeepi	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 atth microservice 5 tting operations, ng, description
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capate of the midterm and individual teacher Z,ZK systems which ar Z,ZK rmation systems w E,ZZK e particular accouration of bookkeepi	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 atth microservice 5 tting operations, ng, description
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on and will be capated by the students are on the midterm and individual teacher. Z,ZK systems which are capated by the midterm and individual teacher. Z,ZK systems which are capated by the midterm and individual teacher. Z,ZK systems which are capated by the midterm and individual teacher.	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 tith microservice 5 ting operations, ng, description is are base of
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is taught in Czech. BI-EP1.24	KZ ds on experience on an and will be capated by the same will be capated by the same will be capated by the midterm and individual teacher. Z ent - students are on the midterm and individual teacher. Z,ZK systems which are capated by the midterm and individual teacher. Z,ZK systems which are capated by the capated b	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 atth microservice 5 ting operations, ng, description is are base of
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	KZ ds on experience on an and will be capate of the midterm and individual teacher Z,ZK systems which ar Z,ZK rmation systems w E,ZZK e particular accounation of bookkeepi gement accounting.	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 aith microservice 5 ting operations, ng, description is are base of 4 d analysis of
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	kZ ds on experience on an and will be capated by the middle of the middl	a matting. 4 with large scale tible to propose 4 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 atth microservice 5 ting operations, ng, description is are base of 4 d analysis of lation and data
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	kZ ds on experience on an and will be capated by the middle of the middl	a matting. 4 with large scale tible to propose 4 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 atth microservice 5 ting operations, ng, description is are base of 4 d analysis of lation and data
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	kZ ds on experience on an and will be capal kZ kZ dividual problems a kZ dividual problems a z ent - students are of the midterm and individual teacher kyzK systems which ar kyzK e particular accouration of bookkeepi gement accounting kZ The monitoring and a source of inform traffic on a hardwar	a matting. 4 with large scale tible to propose 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 tith microservice 5 ting operations, ng, description is are base of 4 d analysis of lation and data
Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation approaches to parallelize other algorithms. The course is prezented in czech language. BI-EP1.24	kZ ds on experience on an and will be capated by the middle of the middl	a matting. 4 with large scale tible to propose 4 4 4 are discussed, 2 due to: -Take an the final term is during the first 4 e connected to 4 aith microservice 5 ting operations, ng, description is are base of 4 d analysis of attion and data re and software

BI-ARD	Interactive applications on Arduino	KZ	4
The subject is designed	or students of first grade of bachelor study as introduction to embedded systems. Students will learn how to design simple appli	ications for moder	n programmable
•	eripherals with help of available libraries. The goal of the subject is to show varied software approaches to control embeddec	•	
	PC. Thanks to possible control on higher (objective) layer, this platform is frequently used for artist performance and therefore	e is suitable even	for Web and
Software Engineering st			
NI-IAM	Internet and Multimedia	Z,ZK	4
	cused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes ac	-	
·	Is (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practic		
	is. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the		•
	f AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recording	g the scene up to	tne presentation
for audience.	Introduction to Committee Coinne	7	
	Introduction to Computer Science	Z	2
•	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 progra and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer		
	ions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are inte	•	
than expected, or even I		nootoa in oompat	
BIE-IMA2	Introduction to Mathematics 2	Z	2
	tend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are	- 1	
examples.		io abio to appiy iii	om m particular
BI-CS2	C# language and data access	KZ	4
	ata access course objective is to introduce students several data access technologies - database, XML, NoSQL - on the Mic	1	
	It to retrieve data - Connection, Command, Data Reader and DataAdapter v ADO.NET. Next, they will learn to use current ted	•	
	and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL		
, , ,	her objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data	` ,	<i>'</i>
· · · · · · · · · · · · · · · · · · ·	course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Mo		· ·
(XML description).		, 3	0
BI-CS3	Language C# - design of web applications	KZ	4
	duced to current technologies in web application development on the .NET platform. They will acquire a comprehensive overvie	Į.	nent possibilities
	l learn to create WebAPI and to use it by client programs.	·	
BI-SQL.1	Language SQL, advanced	KZ	4
,	vledge obtained in BI-DBS. Students become familiar with advanced relational and non-relational features of SQL language. I	n particular stored	program unites,
triggers, recursive querie	s, OLAP support, object-relational constructions. Part of the course is dedicated to practical database optimization from the po	int of view of speci	ialized database
structures like indexes,	clusters, index-organized tables, and materialized views. as well as from the point of view query optimization. Execution plan	and possibilities of	of its. changes
will be discussed. Lectur	es will usually discuss SQL standard, but many features will be demonstrated on Oracle DBMS. Seminars are based on Ora	acle DBMS and pa	artially on
PostgreSQL.			
BI-QAP	Quantum algorithms and programming	KZ	5
	Quantum algorithms and programming udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic		-
Course aims at giving st		s, on which quant	um technologies
Course aims at giving st are based, and algorithr on Python language. Kn	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic his showing advantages and limitations of quantum computing. During tutorials students work in open-source software developments of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VM	s, on which quanti opment kit Qiskit,	um technologies which is based
Course aims at giving st are based, and algorithr on Python language. Kn might be an advantage.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic ns showing advantages and limitations of quantum computing. During tutorials students work in open-source software developwledge of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed.	s, on which quanti opment kit Qiskit, /IM and experienc	um technologies which is based
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic ns showing advantages and limitations of quantum computing. During tutorials students work in open-source software develop- owledge of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab	s, on which quanti opment kit Qiskit, //M and experienc KZ	um technologies which is based e with Python
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented of	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic his showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed by the complete of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is	s, on which quant opment kit Qiskit, MM and experienc KZ	um technologies which is based e with Python 5 we use of the
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developments of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms,	s, on which quant opment kit Qiskit, MM and experienc KZ	um technologies which is based e with Python 5 we use of the
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed on the provided of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dis modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis).	s, on which quant opment kit Qiskit, MM and experienc KZ put on the effecti and analyses of the	um technologies which is based e with Python 5 ve use of the heir properties.
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed on the programming of the programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed on the programming of BI-MA2 or BI-VM. No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is did its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security	s, on which quantic opment kit Qiskit, //M and experienc KZ put on the effectic and analyses of the	um technologies which is based e with Python 5 ve use of the heir properties.
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studen	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dits modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for develop	s, on which quantic opment kit Qiskit, //M and experienc KZ put on the effectic and analyses of the	um technologies which is based e with Python 5 ve use of the heir properties.
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented of available information and At this point, the subject BI-HAS This course is for studer use their gained knowle	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dits modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security at sinterested not only in technical scope of computer science, but also in making products usable - for users and for developing to design, plan and analyse their own projects in the context of human-centered security.	s, on which quanticle open the kit Qiskit, and and experience KZ put on the effection and analyses of the Z,ZK ers. Students of the properties of the control of the properties of the control of the control of the properties of t	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowle.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dits modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security at interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology	s, on which quanticle of the control	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowle NI-MPL NI-MSI	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed on the design of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is ditts modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security its interested not only in technical scope of computer science, but also in making products usable - for users and for developed deep to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit Qiski	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented of available information and this point, the subject BI-HAS This course is for studer use their gained knowle NI-MPL NI-MSI Mathematical semantics	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed on the design of physics is assumed. Statistical Modelling Lab In a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security its interested not only in technical scope of computer science, but also in making products usable - for users and for developed deep to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scot	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit Qiski	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and the subject BI-HAS This course is for studer use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security this interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory.	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit and analyses of the kit Qiskit Alberts of the kit Qiskit and analyses of the kit Qiskit and analyses of the kit Qiskit Alberts of the kit Qiskit and analyses of the kit Qiskit analyses of the kit Qiskit, and analyses of	um technologies which is based e with Python 5 we use of the heir properties. 5 his course can 2 4 a calculus.
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continuous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit and analyses of the kit Qiskit and analyses of the kit Qiskit analyses of the kit Qiskit, and the kit Qiskit, a	um technologies which is based e with Python 5 we use of the heir properties. 5 his course can 2 4 a calculus.
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21 The course is focused of	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security this interested not only in technical scope of computer science, but also in making products usable - for users and for developedge to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continuous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University in the programming languages.	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit and analyses of the kit Qiskit and analyses of the kit Qiskit analyses of the kit Qiskit, and the kit Qiskit, a	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21 The course is focused of includes both PC side a	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developedge to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of Labs.	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit and analyses of the kit Qiskit and analyses of the kit Qiskit analyses of the kit Qiskit, and the kit Qiskit, a	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented cavailable information and this point, the subject BI-HAS This course is for studer use their gained knowled with the subject BI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21 The course is focused of includes both PC side a drivers, simple application.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dits modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security this interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continuous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of Lond development, and APIs of selected devices.	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit, and analyses of the kit Qiskit and analyses of the kit Qiskit and analyses of the kit Qiskit analyses of the kit Qiskit, and the kit Qi	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented cavailable information and this point, the subject BI-HAS This course is for studer use their gained knowled use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21 The course is focused of includes both PC side and drivers, simple application.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanical in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is distained in the stress of the second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security this interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices of the selected devices. Mikrotik technologies	s, on which quantic perment kit Qiskit, and and experience KZ put on the effection and analyses of the Z,ZK ers. Students of the Z,ZK at model of lambda Z,ZK ersal serial bus (UJSB devices, Linus KZ	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows 3
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented cavailable information and this point, the subject BI-HAS This course is for studer use their gained knowled use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21 The course is focused of includes both PC side and drivers, simple application. BI-MIT The main motivation of the side and the	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN no previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dits modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security this interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the development, and APIs of selected devices. Mikrotik technologies the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are context of the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are context of the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are context and some network Mikrotik technologie	s, on which quanticle opment kit Qiskit, of MM and experience KZ sput on the effective and analyses of the CZ/K ers. Students of the CZ/K the commonly used by the commonly used	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowled the subject by the subject	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab In a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is did its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continuous lattices, Scott topology. Procedures as continuous mappings. The Scott theory. Methods of interfacing peripheral devices In methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the development, and APIs of selected devices. Mikrotik technologies The sudents learn how to use and create the architectures of the network solutions which are based on the providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the providers (ISPs).	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit analyses of the kit Qiskit, and analyses of the kit Qiskit analyses	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented cavailable information and this point, the subject BI-HAS This course is for studer use their gained knowled use their gained knowled NI-MPL NI-MSI Mathematical semantics Introduction to category BI-MPP.21 The course is focused of includes both PC side and drivers, simple application BI-MIT The main motivation of the middle internet service pand how to administrate	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic as showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab as a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is a dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security at interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices interfacing of real peripheral devices is focused on techniques based on University and APIs of selected devices. Interfacing of real peripheral devices is focused on techniques based on University to the proper of the peripheral devices and APIs of selected devices. Mikrotik technologies The subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are convicted (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit analyses of the kit Qiskit, and analyses of the kit Qiskit analyses	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic as showing advantages and limitations of quantum computing. During tutorials students work in open-source software development and provides and practically deploy them. The successful completes and their programming. We focus on fundaments of quantum mechanic as showing advantages and limitations of quantum computing. During tutorials students work in open-source software development, and develop of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is a did its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of Lord development, and APIs of selected devices. Mikrotik technologies he subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previo	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit Analyses	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanicals showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed good of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN hos previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is distained in a single and multi-target tracking. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices. In methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of the methods for interfacing of peripheral devices. Mikrotik technologies In methods of the students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary computed data-link, network and transport layer of the OSI model. Modern Object-Oriented Programming in Pharo	s, on which quanticle open the kit Qiskit, and and experience of the kit Qiskit, and and experience of the kit Qiskit, and analyses of the kit Qiskit analyses	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP Object-oriented program.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic as showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab In a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dist modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security its interested not only in technical scope of computer science, but also in making products usable - for users and for develop dge to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing of peripheral devices. In methods for interfacing of peripheral devices. Mikrotik technologies he subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are convolders (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transport layer of the OSI model. Modern Object-Oriented Programming in Pharo mining is currently one of the most wi	s, on which quanticle opment kit Qiskit, and and experience KZ oput on the effective and analyses of the Z,ZK operation operation of the Z,ZK operation operation of the Z,ZK operation operatio	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MPL NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab	s, on which quanticle opment kit Qiskit, and and experience of the second of the secon	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction implementation
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service pand how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex of object systems in moderal discourse.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software developed good of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN to previous knowledge of physics is assumed. Statistical Modelling Lab In a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is distended in the stress of the society of the second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of Londevelopment, and APIs of selected devices. Mikrotik technologies he subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are coroviders (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transport layer of the OS	s, on which quantic perment kit Qiskit, and and experience KZ put on the effective and analyses of the Z,ZK ers. Students of the Z,ZK at model of lambda Z,ZK ersal serial bus (U JSB devices, Linux KZ experience its ability to nakills of design and a needs and areas	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction implementation of interest. In
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowled. NI-MPL NI-MSI Mathematical semantics. Introduction to category. BI-MPP.21 The course is focused of includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service pand how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex of object systems in modaddition to deepening of	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic as showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of providing of linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN to previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is did its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security this interested not only in technical scope of computer science, but also in making products usable - for users and for developedge to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices. In methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University to the development, and APIs of selected devices. Mikrotik technologies he subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are a providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transport layer of the OSI model. Modern Object-Oriented Programming in Pharo ming is currently one of the most widespread paradigms of s	s, on which quantic perment kit Qiskit, and and experience KZ put on the effective and analyses of the Z,ZK ers. Students of the Z,ZK at model of lambda Z,ZK ersal serial bus (U) SB devices, Linux KZ experience its ability to nakills of design and a needs and areas rk on interesting p	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links obts like protocols 4 tural abstraction implementation of interest. In projects and OO
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented cavailable information and this point, the subject BI-HAS This course is for studer use their gained knowled with their gained knowled and the course is focused of includes both PC side and drivers, simple application with their gained how to administrate and technologies of the with their gained knowled with their gained knowled complex of object-oriented program is used to build complex of object systems in modadition to deepening of technologies in terms of	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanics in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of programming and advantages and limitations of quantum computing. During tutorials students work in open-source software development of programming and scape of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is did its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for developing to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of London development, and APIs of selected devices. Mikrotik technologies the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are conviders (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transpor	s, on which quantic perment kit Qiskit, and and experience KZ put on the effective and analyses of the ZK and and a series ability to nakills of design and an analyse and areas rk on interesting prement in the Phalesting premen	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction implementation of interest. In projects and OO ro Consortium.
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MPL NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex of object systems in moraddition to deepening of technologies in terms of BI-MMP	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of Branch of the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN no previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dit is modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security its interested not only in technical scope of computer science, but also in making products usable - for users and for developed to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices in methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the device of programming and peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the Condition of the RouterOS operating system and some network Mikrotik technologies which are bested to the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are broviders (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, netw	s, on which quantic perment kit Qiskit, and and experience KZ put on the effective and analyses of the Z,ZK ers. Students of the Z,ZK at model of lambda Z,ZK ersal serial bus (U) SB devices, Linux KZ experience its ability to nakills of design and a needs and areas rk on interesting p	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links obts like protocols 4 tural abstraction implementation of interest. In projects and OO
are based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented of available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MPL NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused or includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex of object systems in more addition to deepening of technologies in terms of BI-MMP This course is presented.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of BI-MA2 or BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is distinguished in the strength of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security is interested not only in technical scope of computer science, but also in making products usable - for users and for developing to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continuous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices in methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices are practically oriented. Students gain experience with implementation of relevant parts of Londevelopment, and APIs of selected devices. Mikrotik technologies In development, and APIs of selected devices. Mikrotik technologies In the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transport laye	s, on which quantic perment kit Qiskit, and and experience KZ put on the effective and analyses of the Z,ZK ers. Students of lambda Z,ZK ers. Students of lambda ers. KZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ ere its ability to nakills of design and ers. RZ	um technologies which is based e with Python 5 ve use of the heir properties. 5 nis course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction implementation of interest. In projects and OO ro Consortium. 4
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MPL NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused on includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex of object systems in monaddition to deepening of technologies in terms of BI-MMP This course is presented BI-ORL	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development in linear algebra at the level of BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN no previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is dit is modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security Its interested not only in technical scope of computer science, but also in making products usable - for users and for develop dge to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scott theory. Methods of interfacing peripheral devices. Interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the development, and APIs of selected devices. Mikrotik technologies The subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are conviders (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the adaptactically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transport layer of the OSI model. Modern Object-Oriented Programming in Pharo ming is currently one of the most widespread paradigms of software creation, especially	s, on which quanticipe of the common state of	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction implementation of interest. In projects and OO to Consortium. 4 5
Course aims at giving stare based, and algorithm on Python language. Kn might be an advantage. NI-LSM The subject is oriented available information and this point, the subject BI-HAS This course is for studer use their gained knowler. NI-MPL NI-MSI Mathematical semantics Introduction to category. BI-MPP.21 The course is focused on includes both PC side and drivers, simple application. BI-MIT The main motivation of the middle internet service and how to administrate and technologies of the NI-MOP Object-oriented program is used to build complex of object systems in monaddition to deepening of technologies in terms of BI-MMP This course is presented BI-ORL The subject aims to introduce.	udents hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanic in showing advantages and limitations of quantum computing. During tutorials students work in open-source software development of BI-MA2 or BI-LA1 and BI-LA2 (or BI-LIN) is necessary. Previous completion of BI-MA2 or BI-VN No previous knowledge of physics is assumed. Statistical Modelling Lab on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is distinguished in the strength of the semester is focused on the design of methods and algorithms, is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). Human Aspects in Cryptography and Security is interested not only in technical scope of computer science, but also in making products usable - for users and for developing to design, plan and analyse their own projects in the context of human-centered security. Managerial Psychology Mathematical Structures in Computer Science of programming languages. Data types as continuous lattices, Scott topology. Procedures as continuous mappings. The Scottheory. Methods of interfacing peripheral devices in methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on University of the peripheral devices are practically oriented. Students gain experience with implementation of relevant parts of Londevelopment, and APIs of selected devices. Mikrotik technologies In development, and APIs of selected devices. Mikrotik technologies In the subject stands in the introduction of the RouterOS operating system and some network Mikrotik technologies which are providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary compute data-link, network and transport laye	s, on which quanticipe of the common state of	um technologies which is based e with Python 5 ve use of the heir properties. 5 his course can 2 4 a calculus. 5 SB). The course x and Windows 7 the small and or wireless links ots like protocols 4 tural abstraction implementation of interest. In projects and OO to Consortium. 4 5

NI-OLI	1 5.	7 71/	-
The Linux energtin	Linux Drivers	Z,ZK	4
•	g system is an important operating system for personal computer and also for embedded systems. Systems on chip and combini ility of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver developr		
	owledge of Linux operating system architecture, principles of development of various types drivers, including practical experience		donto. The
BI-ACM	Programming Practices 1	KZ	5
_	course for preparing talented student for representation in international programming contests.	1 1	
BI-ACM2	Programming Practices 2	KZ	5
This is a selective	course for preparing talented student for representation in international programming contests.	1 1	
BI-ACM3	Programming Practices 3	KZ	5
This is a selective	course for preparing talented student for representation in international programming contests.	<u> </u>	
BI-ACM4	Programming Practices 4	KZ	5
This is a selective	course for preparing talented student for representation in international programming contests.		
BI-AND.21	Programming for the Android Operating System	KZ	4
This course is pres			
BI-CS1	Programming in C#	KZ	4
_	rise is to introduce .NET Framework as a multi-language development platform. Then, programming language C#, its fundamen		
	pops, definitions and calls of functions will be discussed. Attention is focused on the object oriented programming in C# - class of the properties at the mambers. Carbage Callacter, inheritance and polymerships, callactions, delegates, and generics. Debug		•
	ods, properties, static members, Garbage Collector, inheritance and polymorphism, collections, delegates, and generics. Debug es are emphasized.	ging and exception p	processing, as
BI-PJV	Programming in Java	Z,ZK	4
	ented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	Z,ZIX	7
BI-PJS.1	JavaScript Programming	KZ	4
	urse is an introduction to Javascript programming. Students will learn also best practices and will use tool that eases development	1	=
_	tudents of BIE-WSI-WI.2015 branch of study and do not have required knowledge to register for BIE-TWA.1. They should register	•	
of study.			
BI-KOT	Programing in Kotlin	Z,ZK	4
Kotlin is a modern,	statically-styled object-functional language that exploits the extensive Java language ecosystem while delivering a number of a	dvanced language c	onstructions.
The language is fu	ly Java compliant and allows for mixed projects that preserve existing parts written in Java, and continue with the development	of a modern, object-	functional way
with minimum of bo	iller-plate code. Last but not least, Kotlin is suitable for designing of DSLs (Domain-Specific Languages).		
NI-PSL	Programming in Scala	Z,ZK	4
	ces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language fe		-
	brary. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful framework	s and libraries e.g. P	lay, Cassandra
Scalaz, etc.			
BI-PMA	Programming in Mathematica	Z,ZK	. 4
	rking with modern technical and scientific software. Students will learn how to use different programming styles (functional prog	ramming, rule-based	d programming
	dynamic interactive applications and visualisations, data processing and presentations.	1/7	4
BI-PHP.1	Programing in PHP nt in Czech Main goal of the course is an introduction to PHP - language and technology. Students will learn also best practice:	KZ	4
_	P. The course is recommended for students of BIE-WSI-WI.2015 branch of study and do not have required knowledge to registe		
•	rse in their 3rd semester of study.	7101 BIE 1747 (. 1 . 111)	cy snould
BI-PS2	Programming in shell 2	Z,ZK	4
	neral overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In a		
	other particular scripting languages and will get practical experience with shell script programming.	, , ,	, ,
NI-PDD	Data Preprocessing		
Students learn to r		Z,ZK	5
	repare raw data for further processing and analysis. They learn what algorithms can be used to extract information from various o	Z,ZK data sources, such a	-
-	repare raw data for further processing and analysis. They learn what algorithms can be used to extract information from various on The learn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction of charact	data sources, such a	s images, texts
-		data sources, such a	s images, texts
time series, etc., a		data sources, such a	s images, texts
time series, etc., and pages.	Introduction to mathematics	data sources, such a teristics from images	s images, texts or from web
time series, etc., and pages. BI-PKM	Introduction to mathematics	data sources, such a teristics from images	s images, texts or from web
time series, etc., and pages. BI-PKM This course is press NI-REV Students will get and	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen	data sources, such a teristics from images Z Z,ZK as before and after th	s images, texts or from web 4 5 e main function
time series, etc., an pages. BI-PKM This course is pres NI-REV Students will get an is called. Students	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is designed.	data sources, such a teristics from images Z Z,ZK as before and after the edicated to reverse each	s images, texts or from web 4 5 e main function engineering of
time series, etc., an pages. BI-PKM This course is pres NI-REV Students will get at is called. Students applications writter	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be	data sources, such a teristics from images Z Z,ZK as before and after the dedicated to reverse expected by dedicated to debuggers.	s images, texts or from web 4 5 e main functioengineering of gers: how
time series, etc., an pages. BI-PKM This course is pres NI-REV Students will get an is called. Students applications written debuggers and det	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the comp	data sources, such a teristics from images Z Z,ZK as before and after the dedicated to reverse expected by dedicated to debuggers.	s images, texts or from web 4 5 e main function engineering of gers: how
time series, etc., and pages. BI-PKM This course is press NI-REV Students will get and is called. Students applications writter debuggers and del the course is on the	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex seminars, where students will solve practically oriented tasks from the real world.	Z,ZK as before and after the dedicated to reverse electronicated to debugguer malware scene.	s images, texts or from web 4 5 e main function engineering of gers: how The focus of
time series, etc., an pages. BI-PKM This course is pres NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex seminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I	Z,ZK as before and after the dedicated to reverse electrosted to debugguerer malware scene.	s images, texts or from web 4 5 e main function engineering of gers: how The focus of
time series, etc., an pages. BI-PKM This course is press NI-REV Students will get an is called. Students applications writter debuggers and det the course is on the BI-SCE1 The Seminar of Co	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex eseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant.	Z,ZK as before and after the dedicated to reverse electroace dedicated to debugg outer malware scene.	s images, texts or from web 4 5 e main function engineering of gers: how The focus of
time series, etc., an pages. BI-PKM This course is press NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached incompages.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex eseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of	Z,ZK as before and after the edicated to reverse educated to debugg outer malware scene. Z nce to failures and at the subject is work	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student with scientific
time series, etc., an pages. BI-PKM This course is press NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached incompages.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex eseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant.	Z,ZK as before and after the edicated to reverse educated to debugg outer malware scene. Z nce to failures and at the subject is work	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Students with scientific
time series, etc., an pages. BI-PKM This course is press NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached incomparticles and other presemester.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex eseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te	Z,ZK as before and after the edicated to reverse expected and after the edicated to debugg outer malware scene. Z nce to failures and at of the subject is work eachers. The topics and the subject is a control of the subject i	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Students with scientific re new for each
time series, etc., an pages. BI-PKM This course is presson. NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached in articles and other presents. BI-SCE2	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex eseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of	Z,ZK as before and after the dedicated to reverse expected and after the dedicated to debugg outer malware scene. Z nce to failures and at the subject is work eachers. The topics and z	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student with scientific re new for each
time series, etc., an pages. BI-PKM This course is presson. NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached in articles and other presents. BI-SCE2 The Seminar of Co	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be executable methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer seminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te	Z,ZK as before and after the dedicated to reverse expected and after the dedicated to debugg outer malware scene. Z ance to failures and at eachers. The topics a cance to failures and at part of the subject is work and the subject is work and the subject is and at the subject is work and the	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student: with scientific re new for each
time series, etc., an pages. BI-PKM This course is presson. NI-REV Students will get an is called. Students applications writter debuggers and det the course is on the BI-SCE1 The Seminar of Co are approached in articles and other presents. BI-SCE2 The Seminar of Co are approached income approached income approached income articles and other presents.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be executable methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer seminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the computer Engineering Seminar II Computer Engineering Seminar II mputer Engineering Seminar II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant to the seminar terminate in the selected supervisor is a seminar to the seminar terminate in the selected supervisor is sudents who want to deal with deeper topics of digital design, reliability and resistant to the seminar terminate is a solution of the seminar terminate in the selected supervisor is sudents who want to deal with deeper topics of digital design, reliability and resistant to the seminar terminate is a solution of the seminar terminate in the seminar terminate is a solution of the seminar to the seminar terminate is a solution of the seminar terminate is a solution of the seminar terminate in the seminar terminate is a solution of the seminar terminate in the seminate is a solution of the seminar terminate in the seminate is a solution of the seminate in the seminate is a solution of the seminate in the seminate in the semi	Z,ZK as before and after the dedicated to reverse a dedicated to debugate and at the subject is work eachers. The topics and at of the subject is work and the subject is work at the subject is work	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student: with scientific re new for each ttacks. Students with scientific with scientific
time series, etc., an pages. BI-PKM This course is presson. NI-REV Students will get an is called. Students applications writter debuggers and det the course is on the BI-SCE1 The Seminar of Co are approached in articles and other presents. BI-SCE2 The Seminar of Co are approached income approached income approached income articles and other presents.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be executable methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer seminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of computer Engineering Seminar II mputer Engineering Seminar II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is limited by the possibilities of the seminar term.	Z,ZK as before and after the dedicated to reverse a dedicated to debugate and at the subject is work eachers. The topics and at of the subject is work and the subject is work at the subject is work	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student: with scientific re new for each ttacks. Students with scientific with scientific
time series, etc., an pages. BI-PKM This course is presson. NI-REV Students will get an is called. Students applications writter debuggers and det the course is on the BI-SCE1 The Seminar of Co are approached incarticles and other presents. BI-SCE2 The Seminar of Co are approached incarticles and other presents.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be executable methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer seminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of computer Engineering Seminar II mputer Engineering Seminar II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistant lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is limited by the possibilities of the seminar term.	Z,ZK as before and after the dedicated to reverse a dedicated to debugate and at the subject is work eachers. The topics and at of the subject is work and the subject is work at the subject is work	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student: with scientific re new for each ttacks. Students with scientific with scientific
time series, etc., an pages. BI-PKM This course is pressible. NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached incarticles and other pages and other pages. BI-SCE2 The Seminar of Co are approached incarticles and other pages. BI-SCE2 The Seminar of Co are approached incarticles and other pages. BI-ST1	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be be used in other than the seminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar technology. In the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or orders in the subject. Each students who want to deal with deeper topics of digital design, reliability and resistant to the subject is limited by the possibilities of the seminar techniq	Z,ZK us before and after the ledicated to reverse of dedicated to debugg outer malware scene. Z unce to failures and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and the subject is work eachers.	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Students with scientific re new for each 4 ttacks. Students with scientific re new for each
time series, etc., an pages. BI-PKM This course is pressible. NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached incarticles and other pages and other pages. BI-SCE2 The Seminar of Co are approached incarticles and other pages. BI-SCE2 The Seminar of Co are approached incarticles and other pages. BI-ST1 The subject is oriented.	Introduction to mathematics ented in Czech. Reverse Engineering equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is do in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the complex eseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal lividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te	Z,ZK us before and after the ledicated to reverse of dedicated to debugg outer malware scene. Z unce to failures and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and the subject is work eachers.	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student: with scientific re new for each with scientific re new for each scientific
time series, etc., an pages. BI-PKM This course is pressible. NI-REV Students will get an is called. Students applications writter debuggers and del the course is on the BI-SCE1 The Seminar of Co are approached incarticles and other pages and other pages. BI-SCE2 The Seminar of Co are approached incarticles and other pages. BI-SCE2 The Seminar of Co are approached incarticles and other pages. BI-ST1 The subject is oriented.	Introduction to mathematics ented in Czech. Reverse Engineering quainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happen will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is di in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be rugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the comp esseminars, where students will solve practically oriented tasks from the real world. Computer Engineering Seminar I reputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or ordessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te Computer Engineering Seminar II reputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistal dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part or ordessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar te Network Technology 1 ted to providing the students basic information and practical skills from the area of digital and IP networks. The subject is according to the subj	Z,ZK us before and after the ledicated to reverse of dedicated to debugg outer malware scene. Z unce to failures and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and at the subject is work eachers. The topics and the subject is work eachers.	s images, texts or from web 4 5 e main function engineering of gers: how The focus of 4 ttacks. Student: with scientific re new for each with scientific re new for each scientific

BI-ST3 Network Technology 3	Z	3
Students will further enhance their knowledge acquired from previous BI-ST1 and BI-ST2 courses. Principles of routing and switching presented during the further extended in the course. Students will be able to start fine-tune protocols' settings to gain certain advantages like increased efficiency, presented during the following presented	_	
simple topology, security, etc.	dictability, exterior	on beyond a
BI-ST4 Network Technology 4	Z	3
Students will further enhance their knowledge already acquired from previous BI-ST1, BI-ST2, and BI-ST3 courses. Principles of routing and switch	• .	•
BI-ST2 courses got further extended in BI-ST3. Students were able to start fine-tune protocols' settings to gain certain advantages like increased ef beyond a simple topology, security, etc. This module teaches students to configure and fine-tune Wide Area Networks and to experience a complete		=
Broadcast Multiple Access) which radically differs from well-known Ethernet (broadcast) type of networks. Students will also manage router and swi		•
recoveries, and emergency procedures. Also the security aspect is treated; students will learn possible intra- and inter-network attacks and the mitignetwork running.	jation ways while i	maintaining the
BI-SKJ.21 Scripting Languages	Z,ZK	4
Students gain a general overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In account of the control of	1	deeper insight
into shell and some other particular scripting languages and will get practical experience with shell script programming.	7 71/	
BI-SOJ Machine Oriented Languages Students of the course will gain an ability to create their own programs in the assembly language of the most common PC platform focusing on optim.	Z,ZK	4 cessor's features
and efficient cooperation of software with hardware. Next, there will be discussed x86 specifics of the majority of OSes from the application point of vie	· · · · · · · · · · · · · · · · · · ·	
This knowledge will be used during reverse engineering, optimization, and evaluation of code security.		
BI-SEP World Economy and Business This course is presented in Czech. The course introduces students of technical university to the international business. It does that predominantly b	Z,ZK	dual countries
and key regions of world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as we		
corruption and economic 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 to take bachelor level of this course BIE-SEP as a prerequisite. NUCVE	7 71/	F
NI-SYP Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge	Z,ZK of various variants	and applications
of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.		
BI-GIT Version control system GIT	KZ	2
Students will be introduced to basic principles of version control systems. These principles will be then shown on DCVS Git both theoretically and p even the implementation details will be shown. Students will be challenged to use Git as users, project managers, team leaders as well as Git serve		articular system
BIE-SEG Systems Engineering	Z	0
This is an introductory class on systems engineering for bachelor students in computer science. The goal of the class is to introduce basic principles	of operating syst	ems for students
to understand processor and memory virtualization. Seeing and actually understanding virtualization is the overarching theme of the class. After take	_	
understand the difference between processes and threads as well as emulation and virtualization, what virtual memory is and how it works, what coparallelism, and how processes and threads synchronize efficiently to overcome concurrency for communication.	incurrency is, as o	pposed to
TV2K1 Physical Education 2	Z	1
BI-TS1 Theoretical Seminar I	Z	4
Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clause treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course		•
other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.	s a work with scie	nuiic papers and
BI-TS2 Theoretical Seminar II	Z	4
Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classification of the contemporary theoretical computer science and the contemporary theoretical computer science.		-
are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.	s a work with scie	ntific papers and
BI-TS3 Theoretical Seminar III	Z	4
Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science.		•
are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.	s a work with scie	ntific papers and
BI-TS4 Theoretical Seminar IV	Z	4
Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a cla	1	up. The students
are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course other scholarly literature. The conscitute limited by the the potentials of the company.	s a work with scie	ntific papers and
other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar. BI-TDA Test driven architecture	KZ	4
The course is focused on practical examples of how to develop, test, and deploy software with tools like GitLab, Docker, Kubernetes, and more that	1	I
world. This course has a strong connection on courses like BI(E)-SI1 and BI(E)-SI2. The main goal of this course is to learn by examples that occur		
NI-TSP Testing and Reliability Students will gain knowledge about pirguit testing and about methods for increasing reliability and acquirity. They will get practical skills to be able to	Z,ZK	5
Students will gain knowledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to the intuitive path sensitization and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with		· ·
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 contex development and will experience hands-on application testing using both manual and automated testing. At the end of the semester, the student sh		
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		-
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 for 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. BI-CCN Compiler Construction	Z,ZK	5
BI-CCN Compiler Construction This is an introductory class on compiler construction for bachelor students in computer science. The goal of the class is to introduce basic principle	1 '	-
understand the design and implementation of programming languages. Seeing and actually understanding self-compilation is the overarching them	· · · · · · · · · · · · · · · · · · ·	
	·	

BI-TEX	TeX and Typography	Z,ZK	4
	I in Czech. This course gives basics of programming in TeX (plain TeX, ConTeXt, LaTeX, OpTeX, LuaTeX). Te second part of the	ne course focuses	on typographic
rules.	Introduction to Common Common United	7.71/	
BI-EHD	Introduction to European Economic History I in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	Z,ZK	3
BI-KSA	Cultural and Social Anthropology	ZK	2
,	se aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diver	ı	
	n from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, he	=	
shown. The course is pro	esented in Czech.	-	
BI-ULI	Introduction to Linux	Z	2
Students become familia	ar with the basics of the Linux operating system using e-learning form. They learn to work with the command line and become	e familiar with bas	ic commands
and techniques of a Uni	x-like system. Topics can be studied first theoretically and then practically verified in a virtual machine (terminal).		
BI-OPT	Introduction to Optical Networks	Z,ZK	4
=	riew of optical networking technology with the emphasis on practical utilization in Internet and in network infrastructures, on po	-	
•	ology and on their solutions. The course will include the history of optical communications, an overview of passive componen s, and others), and an overview of active components (optical switches and amplifiers, high-speed coherent transmission sys		
	s, and others), and an overview of active components (optical switches and amplifiers, high-speed conferent transmission systems of the properties of the pr	•	
	nsfer, or sensor networks. The labs will focus on real work with optical components and on measurement of their parameters		
from practice.			
NI-VCC	Virtualization and Cloud Computing	Z,ZK	5
Students will gain knowl	edge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and	l organizations. Th	ney will get
acquainted with virtualiz	ation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficiency	ciently operate an	d optimize the
	s of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effecti		-
	computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skill	ls in the use of mo	dern integration
BI-VHS	Continuous integration and development).	ZK	
-	Virtual game worlds ts to create a complex virtual world. The course is a continuation of basic graphical courses (MGA, PGR, BLE,). This current st	I	4 e is furthermore
	eory of game design, principles of writing dialogues and characters in order to create a functional and complex virtual world.	_	
· · · · · ·	the task of converting scenes and their dynamics into a fully virtual environment suitable for VR devices.		
BI-VR1	Virtual reality I	KZ	4
· ·	eality (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 t	he ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves co	mputational think	ing, empathy
and shared social activit	ies.		
BI-VR2	Virtual reality II	KZ	3
	se Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The ol	bjective is to deve	lop applications
· · · · · · · · · · · · · · · · · · ·	d gamification in various social metaverse and desktop engines.		
BI-VAK.21	Selected Applications of Combinatorics	Z	3
· · · · · · ·	and the state of t	1	-
	duce students in an accessible form to various branches of theoretical computer science and combinatorics. In contrast to the	e basic courses, v	ve approach the
issue from applications t	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basic	e basic courses, v sic data structure	ve approach the s. Furthermore,
issue from applications to with the active participate	o theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some ba ion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in	e basic courses, v sic data structure nformatics. Areas	ve approach the s. Furthermore, from which we
issue from applications to with the active participat will select problems to b	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basic	e basic courses, v sic data structure nformatics. Areas	ve approach the s. Furthermore, from which we
issue from applications to with the active participat will select problems to b	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some bation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in e solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimi	e basic courses, v sic data structure nformatics. Areas	ve approach the s. Furthermore, from which we
issue from applications with the active participat will select problems to be also try to implement so BI-VMM	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimi lutions to the studied problems with a special focus on the effective use of existing tools.	e basic courses, value of the structure	ve approach the ss. Furthermore, from which we Students will
issue from applications with the active participat will select problems to be also try to implement so BI-VMM The lecture begins with	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilations to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods	e basic courses, value of the structure	we approach the s. Furthermore, from which we Students will
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilations to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a	e basic courses, value basic data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform	we approach the s. Furthermore, from which we Students will 4 eries and their h. We examine
issue from applications with the active participat will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilations to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability	e basic courses, value of the structure	we approach the s. Furthermore, from which we Students will
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recur	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimized by the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a natroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability.	e basic courses, value of the second of the	we approach the s. Furthermore, from which we Students will 4 eries and their n. We examine
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recur	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK	we approach the s. Furthermore, from which we Students will 4 eries and their n. We examine 4
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursions and the student can once with the selection of the select	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize and introduction to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reference.	e basic courses, value of the second of the	we approach the s. Furthermore, from which we Students will 4 eries and their n. We examine 4 10 n. Before the
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursions and the student can once with the linear student can once with the linear programming the Dean of the student can once with the studen	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize as olved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize and introduction to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Sechelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content.	e basic courses, value of the course of the	ye approach the s. Furthermore, from which we Students will 4 eries and their n. We examine 4 10 n. Before the extent of the
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship the Dean of the internship. Auxiliary course	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize and introduction to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reference.	e basic courses, value of the course of the	ye approach the s. Furthermore, from which we Students will 4 eries and their n. We examine 4 10 n. Before the extent of the eeks of full-time
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship the Dean of the internship. Auxiliary course	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize as solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize and introduce and studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a not introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rates BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided	e basic courses, value of the course of the	ye approach the s. Furthermore, from which we Students will 4 eries and their n. We examine 4 10 n. Before the extent of the eeks of full-time
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship the Dean of the internship. Auxiliary coulemployment with a foreigned.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize as solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize and introduce and studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a not introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rates BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided	e basic courses, value of the course of the	ye approach the s. Furthermore, from which we Students will 4 eries and their n. We examine 4 10 n. Before the extent of the eeks of full-time
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship the Dean of the internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in the solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimize the solved the study and introduce of a complex variable. Next, we present the Lebesgue integral. We then a not introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rates BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line.	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier set wavelet transform Z,ZK essearch institution ional content and correspond to 4 wallet two subjects	ye approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship the Dean of the student can once in the student can once	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilations to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rese BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	ye approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship the Dean of the internship. Auxiliary coulemployment with a content of the internship. Auxiliary coulemployment of the internship.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilations to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Sieve functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess rese BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rate BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the profess rate BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the profess rate BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	te approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the eeks of full-time in the internship
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship the Dean of the internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship the Dean of the internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary coulemployment with a foreign exceeds the academic y BI-ZS20 Each student can once in the properties.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a nitroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess are sel-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rother foreign internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rother foreign scientific and/or rother foreign scientific and/or rother foreign scientific and/or rother foreign internship at a foreign university or other foreign scientific and/or rother for	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	te approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the eeks of full-time in the internship
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship the Dean of the internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship the Dean of the internship. Auxiliary couremployment with a foreign exceeds the academic y employment with a foreign employment with a foreign exceeds the academic y	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in a solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a nitroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profession institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess sets BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the professional content. The student must provide evidence of the profess sets BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the institution. The maximum number of	e basic courses, vasic data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK esearch institution ional content and correspond to 4 was into two subjects Z esearch institution ional content and correspond to 4 was into two subjects ional content and correspond to 4 was into two subjects	ye approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the extent of the extent of the extent of the internship
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we is the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimi lutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professions BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rates BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the professional content. The student must provide evidence of the profess rates BI-ZS10, BI-ZS20, BI-ZS30 are u	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects Z	ye approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the extent of the extent of the extent of the internship 30
issue from applications with the active participat will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we is the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once in the studen	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimi lutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rases BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess rases BI-ZS10, BI-ZS30, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rases BI-ZS10, BI-ZS30, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 1	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	ye approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the internship 30 in. Before the
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we is the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship the Dean of the student can once in the student can	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimi lutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a nitroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability Sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rate Bachelor internship abroad for 20 credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rate Bachelor internship abroad for 30 credits a student can earn for one internship in 1S KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship in 1S KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship in 1S KOS. Every 10 credits of an institution. Th	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	te approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the
issue from applications with the active participal will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we is the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship the Dean of the internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship the Dean of the internship. Auxiliary couriernship.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimi lutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then an introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rases BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess rases BI-ZS10, BI-ZS30, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess rases BI-ZS10, BI-ZS30, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 1	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	te approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the extent of the extent of the extent of the eeks of full-time if the internship 30 in. Before the extent of the eeks of full-time if the internship
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we is the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS20 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship the Dean of the internship. Auxiliary couremployment with a foreign exceeds the academic y BI-ZS30 Each student can once internship the Dean of the internship. Auxiliary couriemship.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in esolved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimizations to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professions are seen as a student can earn for one internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professions as BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachel	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects Z esearch institution ional content and correspond to 4 wall into two subjects	te approach the is. Furthermore, from which we Students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the extent of the extent of the extent of the eeks of full-time if the internship 30 in. Before the extent of the eeks of full-time if the internship
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursive size of the linear programming SI-ZS10 Each student can once of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZS20 Each student can once of the internship. Auxiliary count internship. Auxiliary count internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZS30 Each student can once of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZS30 Each student can once of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZIVS	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudents, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudent will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a nitroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rate FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess ses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess are slead-line. Bachelor internship abroad for 30 credits within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the profess are slead-line. Bachelor internship abroad for 30 credits withi	e basic courses, vasic data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z essearch institution ional content and correspond to 4 w into two subjects Z essearch institution ional content and correspond to 4 w into two subjects Z essearch institution ional content and correspond to 4 w into two subjects X essearch institution ional content and correspond to 4 w into two subjects KZ	te approach the is. Furthermore, from which we students will 4 eries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 30 in. Before the extent of the eeks of full-time if the internship 30 in. Before the extent of
issue from applications with the active participat will select problems to b also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recurs BI-ZS10 Each student can once internship the Dean of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZS20 Each student can once internship the Dean of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZS30 Each student can once internship the Dean of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZS30 Each student can once internship the Dean of the internship. Auxiliary count employment with a foreign exceeds the academic by BI-ZIVS Intelligent embedded sy	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudents, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudency will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a natroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers. The student must provide evidence of the profess ares BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers. Pick in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess are BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution.	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects KZ of the course is to	te approach the is. Furthermore, from which we Students will 4 teries and their in. We examine 4 10 in. Before the extent of the eeks of full-time if the internship 20 in. Before the extent of the eeks of full-time if the internship 30 in. Before the extent of the eeks of full-time if the internship 4 teach students
issue from applications with the active participat will select problems to balso try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursion of the linear programming SI-ZS10 Each student can once internship the Dean of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the intelligent embedded symodern humanoid robot.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some bation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudents, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudence of the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a not reduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers or ses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits or institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers of the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess sess BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor in	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects KZ of the course is to control, sensor reaccontrol, senso	te approach the is. Furthermore, from which we Students will 4 10 10 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 4 teach students ding, application
issue from applications with the active participat will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursion of the linear programming SI-ZS10 Each student can once internship the Dean of the internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once in the studen	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basion of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudents, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudency will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimilutions to the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a natroduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers. The student must provide evidence of the profess ares BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers. Pick in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess are BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of an institution.	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects KZ of the course is to control, sensor reaccontrol, senso	te approach the is. Furthermore, from which we Students will 4 10 10 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 4 teach students ding, application
issue from applications with the active participat will select problems to balso try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursion of the linear programming SI-ZS10 Each student can once internship the Dean of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the internship. Auxiliary coursemployment with a foreign exceeds the academic year of the intelligent embedded symodern humanoid robot.	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some bation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudents, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudence of the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a not reduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers or ses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits or institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers of the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess sess BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor in	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects KZ of the course is to control, sensor reaccontrol, senso	te approach the is. Furthermore, from which we Students will 4 10 10 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 4 teach students ding, application
issue from applications with the active participat will select problems to be also try to implement so BI-VMM The lecture begins with properties. Further, we in the linear programming NI-VYC Classical theory of recursion of the linear programming SI-ZS10 Each student can once internship the Dean of the internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once internship. Auxiliary coursemployment with a foreign exceeds the academic yield by the student can once in the studen	to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some bation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudents, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) in estudence of the studied problems with a special focus on the effective use of existing tools. Selected Mathematical Methods an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then a not reduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples. Computability sive functions and effective computability. Bachelor internship abroad for 10 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers or ses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits or institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 20 credits within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or refers of the vice-dean for study affairs assesses the professional content. The student must provide evidence of the profess sess BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits of institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided ear's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor in	e basic courses, value data structure informatics. Areas zation and more. Z,ZK address Fourier se wavelet transform Z,ZK Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects Z esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects X esearch institution ional content and correspond to 4 w into two subjects KZ of the course is to control, sensor reaccontrol, senso	te approach the is. Furthermore, from which we Students will 4 10 10 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 30 1. Before the extent of the eeks of full-time if the internship 4 teach students ding, application

BI-ZPI	Process engineering	KZ	4
Students will learn fund	amentals 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 used	I notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of	business process	es 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 info	ormation and busi	iness strategy of
an enterprise.			
BI-ZNF	PHP Framework Nette - basics	KZ	3
Students will gain the ba	sics of PHP framework Nette. They will learn how to practically work with MVP architecture and various libraries of this Czecl	n popular framewo	ork. The resulting
knowledge should serve	e for the efficient creation of a web backend in PHP language.		
BI-IOS	Fundamentals of iOS Application Development for iPhone and iPad	KZ	4
This course is presented	d in Czech.	•	
BI-ZWU	Introduction to Web and User Interfaces	Z,ZK	4
This course is presente	d 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:

roup:					
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
Unix Administration Zden k Muziká , Petr Zemánek, Miroslav Prágl Zden k Muziká Zden k Muziká (Gar.)	Z,ZK	5	2P+2C	L	V
Web and Database Server Administration Michal Valenta, Lukáš Ba inka Lukáš Ba inka Michal Valenta (Gar.)	Z,ZK	5	2P+2C	Z	V
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
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
Architectures of Computer Systems Michal Štepanovský, Pavel Tvrdík Michal Štepanovský Pavel Tvrdík (Gar.)	Z,ZK	5	2P+2C	Z	V
Secure Code Josef Kokeš Josef Kokeš (Gar.)	Z,ZK	5	2P+2C	L	V
DB Technologies for Big Data Monika Borkovcová Monika Borkovcová (Gar.)	KZ	5	2P+2C	Z,L	V
Economic Business Processes David Buchtela David Buchtela Tomáš Evan (Gar.)	Z,ZK	5	2P+2C	L,Z	V
Financial Business Intelligence David Buchtela David Buchtela Petra Pavlí ková (Gar.)	Z,ZK	5	2P+2C	Z,L	V
Hardware Security Ji í Bu ek Ji í Bu ek Ji í Bu ek (Gar.)	Z,ZK	5	2P+2C	Z	V
Internet of Things Viktor erný, Lenka Kosková Tísková Lenka Kosková Tísková (Gar.)	Z,ZK	5	2P+2C	Z	V
Computer Units Pavel Kubalík Pavel Kubalík Pavel Kubalík (Gar.)	Z,ZK	5	2P+2C	Z	V
Conceptual Modelling Robert Pergl, Marek B Iohoubek Robert Pergl Robert Pergl (Gar.)	Z,ZK	5	2P+2C	Z	V
Mathematical Logic Kate ina Trlifajová Kate ina Trlifajová (Gar.)	Z,ZK	5	2P+2C	Z	V
Methods of interfacing peripheral devices Miroslav Skrbek Miroslav Skrbek (Gar.)	Z,ZK	5	2P+2C	Z	V
Modern Data Formats Petr Pauš Petr Pauš (Gar.)	KZ	3	1P+1C	Z	V
Object-Oriented Programming Filip K ikava, Petr Máj, Filip íha Filip K ikava Filip K ikava (Gar.)	Z,ZK	5	2P+2C	Z	V
Practical Statistics Kamil Dedecius, Petr Novák Petr Novák Petr Novák (Gar.)	KZ	5	1P+2C	L	V
Practical Digital Design Martin Novotný Martin Novotný Martin Novotný (Gar.)	KZ	5	2P+2C	Z	V
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
Programming Languages and Compilers Jan Janoušek, Tomáš Pecka Jan Janoušek (Gar.)	Z,ZK	5	2P+1C	L	V
	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 Zden k Muziká (Patr Zemánek, Miroslav Prágl Zden k Muziká Zden k Muziká (Gar.) Web and Database Server Administration Michal Valenta, Lukáš Ba inka Lukáš Ba inka Michal Valenta (Gar.) Algorithms and Graphs 2 Dušan Knop, Michal Opler, Ond ej Suchý, Tomáš Valla, Radek Hušek Ond ej Suchý Martin Mandik Ji i Dostál, Jakub Tetera, Michal Polák, Martin Šutovský, Martin Mandik Ji i Dostál, Jakub Tetera, Michal Polák, Martin Šutovský, Martin Mandik Ji i Dostál, Jakub Tetera, Michal Polák, Martin Šutovský, Martin Mandik Ji i Dostál, Jakub Tetera, Michal Stepanovský Pavel Tvrdík (Gar.) Secure Code Josef Kokeš Josef Kokeš Josef Kokeš (Gar.) DB Technologies for Big Data Monika Borkovcová Monika Borkovcová Monika Borkovcová (Gar.) Economic Business Processes David Buchtela David Buchtela Tomáš Evan (Gar.) Financial Business Intelligence David Buchtela David Buchtela Petra Pavli ková (Gar.) Hardware Security Ji i Bu ek Ji i Bu ek (Gar.) Internet of Things Viktor erný, Lenka Kosková Tísková Lenka Kosková Tísková Lenka Kosková Tísková (Gar.) Conceptual Modelling Robert Pergl, Marek B Iohoubek Robert Pergl Robert Pergl (Gar.) Mathematical Logic Kate ina Tilifajová Kate ina Trilifajová Kate ina Trilifajová (Gar.) Methods of interfacing peripheral devices Miroslav Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.) Modern Data Formats Petr Pauš Petr Pauš (Gar.) Object-Oriented Programming Filip K ikava, Petr Múj, Filip ina Filip K ikava Filip K ikava (Gar.) Practical Statistics Kamil Dedecius, Petr Novák Petr Novák Petr Novák (Gar.) Practical Statistics Varia Parla Pavik Varia Novotný Martin Novotný (Gar.) Law and Informatics Zden k Ku era, Št pánka Havlíková Zden k Ku era (Gar.)	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 Zden k Muzikâ, Pet Zemänek, Miroslav Prägl Zden k Muziká Zden k Muziká (Gar.) Web and Database Server Administration Michal Valenta, Lukáš Ba inka Lukáš Ba inka Michal Valenta (Gar.) Algorithms and Graphs 2 Dušan Knop, Michal Opler, Ond ej Suchý, Tomáš Valla, Radek Hušek Ond ej Suchý Ond ej Suchý (Gar.) Applied Network Security Velena Trofimova, Ji i Dostál (Jar.) Architectures of Computer Systems Michal Stepanovský, Pavel Tvrdík Michal Stepanovský, Pavel Tvrdík (Gar.) Architectures of Computer Systems Michal Stepanovský, Pavel Tvrdík Michal Stepanovský Pavel Tvrdík (Gar.) Becure Code Josef Kokeš Josef Kokeš Josef Kokeš (Gar.) DB Technologies for Big Data Monika Borkovcová Monika Borkovcová Monika Borkovcová (Gar.) Economic Business Processes David Buchtela David Buchtela Tomáš Evan (Gar.) Financial Business Intelligence David Buchtela David Buchtela Petra Pavli ková (Gar.) Hardware Security Ji Bu ek Ji i Bu ek Ji i Bu ek (Gar.) Internet of Things Viktor erný, Lenka Kosková Tisková Lenka Kosková Tisková Lenka Kosková Tisková (Gar.) Computer Units Pavel Kubalík Pavel Kubalík (Gar.) Mathematical Logic Kate ina Trilfajová Kate ina Trilfajová (Gar.) Mathematical Logic Kate ina Trilfajová Kate ina Trilfajová (Gar.) Mathematical Logic Kate ina Trilfajová Kate ina Trilfajová (Gar.) Methods of interfacing peripheral devices Miroslav Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.) Practical Statistics Ramil Dedecius, Petr Novák Petr Novák Petr Novák (Gar.) Practical Digital Design Martin Novotný Martin Novotný (Gar.) Practical Digital Design Martin Novotný Martin Novotný (Gar.) Programming Languages and Compilers 7 ZK	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 Zoen k Muzikā , Peir Zemānek, Miroslav Prāgi Zden k Muzikā Zden k Z,ZK 5 Muzikā (Gar.) Web and Database Server Administration Michal Valenta, Lukāš Ba inka Lukāš Ba inka Michal Valenta (Gar.) Algorithms and Graphs 2 Dušan Knop, Michal Oplor, Ond ej Suchý, Tomáš Valla, Radek Hušek Ond ej Z,ZK 5 Suchý Ond ej Suchý (Gar.) Applied Network Security Yelena Trofimova, Ji i Dostāl, Jakub Tetera, Michal Polāk, Martin Šutovský, Martin Mandik Ji i Dostāl Ji i Dostāl (Gar.) Architectures of Computer Systems Michal Stepanovský, Pavel Tvrdik Michal Štepanovský Pavel Tvrdik (Gar.) Secure Code Josef Kokeš Josef Kokeš Josef Kokeš (Gar.) BT Technologies for Big Data Monika Borkovcová Monika Borkovcová Monika Borkovcová (Gar.) Economic Business Processes David Bucintela David Buchtela Tomáš Evan (Gar.) Financial Business Intelligence David Euchtela David Buchtela Tomáš Evan (Gar.) Hardware Security Ji I Bu ek Ji i Bu ek (Gar.) Internet of Tinings Viktor erný, Lenka Kosková Lenka Kosková T ísková Lenka Kosková T ísková (Gar.) Mathematical Logic Kate ina Titilajová Kate ina Trilfajová (Kate.) Methods of interfacing peripheral devices Almosiava Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.) Methods of interfacing peripheral devices Almoslava Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.) Methods of interfacing peripheral devices Almoslava Skrbek Miroslav Skrbek Miroslav Skrbek (Gar.) Methods of interfacing peripheral devices Almoslava Skrbek Miroslav Skrbe	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 Ziden k Muziká, Petr Zemánek, Miroslav Prágl Zden k Muziká Zden k Auziká (Gar.) Web and Database Server Administration Michal Valenta (Gar.) Web and Database Server Administration Michal Valenta (Gar.) Web and Database Server Administration Michal Valenta (Gar.) Algorithms and Graphs 2	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.) Tutors, authors and guarantors and guarantors (gar.) Tutors, authors and guarantors (gar.) Tutors, authors and guarantors and guarantors (gar.) Tutors, authors and guarantors (gar.) Tutors, authors and guarantors and guarantors (gar.) Tutors, authors and guarantors and g

	,					
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 Fesl Jan Fesl (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 i 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 (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 Iohoubek, David Pokorný, Jakub Tetera, František Ková, Martin Mandík, Tomáš Lu ák David Pokorný Jan B Iohoubek (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 Jií Kašpar Jií Kašpar Jií Kašpar (Gar.)	Z,ZK	5	2P+2C	L	V
BI-VIZ.21	Data Visualization 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 (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 (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

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-SVZ.21 Machine vision and image processing

Camera systems are becoming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluate image information. The course introduces students to different types of camera systems and a variety of methods for image and video processing. The course is focused on practical use of camera systems for solving problems of practice that the graduates may encounter.

BI-SP2.21 Team Software Project 2

Students gain hands-on experience with the iterative development process while working on a large-scale software project. The first iteration is the result of the BIE-SP1 course project. However, in this follow-up, the functionality, testing, and documentation of the software system being developed will be emphasized. Students will work in teams of 4-6 people. The

RI-MPP 21 Methods of interfacing peripheral devices 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 development, and APIs of selected devices. Unix Administration Students will learn the internal structure of the UNIX operating system, with the administration of its basic subsystems and with the security principles. They will understand the differences between user and administrator roles. They will get theoretical and practical knowledge of user management and administration, of users access rights, file systems, disk subsystems, processes, memory, network services and remote access, and in the areas of system deployment and virtualization. In the labs, they will verify the knowledge from the lectures on specific examples from practice. 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, and backup complex database and web service systems. The principles will be demonstrated on the PostgreSQL relational database engine and Apache will be used as an example of a web server. Algorithms and Graphs 2 5 This course, presented in Czech, introduces basic algorithms and concepts of graph theory as a follow=up on the introduction given in the compulsory course BI-AG1.21. It further delives into advances data structures and amortized complexity analysis. It also includes a very light introduction to approximation algorithms. For English version of the course see BIE-AG2.21. Z,ZK BI-ASB.21 Applied Network Security 5 The aim of the course is to introduce selected topics from computer networks in terms of cybersecurity. These topics extend the basic knowledge gained in course BI-PSI with actual security applications like the public key infrastructure, encrypted network protocols, link and network layer security or wireless networks. After finishing the course student will get knowledge of security applications in computer networks. BI-APS.21 Architectures of Computer Systems Z,ZK 5 Students will learn the construction principles of internal architecture of computers with universal processors at the level of machine instructions. Special emphasis is given on the pipelined instruction processing and on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the principles of instruction processing not only in scalar processors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness of the sequential model of the program. The course further elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory coherence and consistency in such systems. BI-BEK.21 Secure Code The students will learn how to assess security risks and how to take them into account in the design phase of their own code and solutions. After getting familiar with the threat modeling theory, students gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every program needs to run with administrator privileges. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securing data and the relationships of security and database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the defense against them. DB Technologies for Big Data BI-BIG.21 5 K7 Students will be introduced into the field of Big Data processing where nonrelational (NoSQL) database engines are typically used today. The course is focused practically so that after finishing the course students were able to choose suitable tools (mostly open source) and techniques, design and implement a simplest reproducible method of data processing (data collection, transformation/aggregation, presentation). Students get acquainted with various architectures for processing and storing big data. A theoretical foundation and presentation of individual technologies will be supplemented with specific examples from practice. Economic Business Processes 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 aspects 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 the company's life cycle, from the establishment of the company, through the management of property and capital structure, financing of the company, determining the cost function of the company and labor costs, to evaluating the financial health of the company and its eventual rehabilitation or termination. BI-FBI.21 Financial Business Intelligence The aim of the course is to acquaint students primarily with financial accounting as a tool for recording business operations and documents for business analysis, determining its value and other indicators for comparison with other companies and management decision process at the tactical and strategic level. The second view is management accounting as a tool for financial management and prediction of business development. Management accounting allows monitoring of the financial status and performance of business activities over several accounting periods, enables a multidimensional view of business data, enables to control effectively factors affecting the return on invested capital and to use value information to assess options related to future business decisions. The principles of management accounting, described in this course, are the basis of Business Intelligence modules in business information systems, decision support systems, and other knowledge-oriented systems. BI-HWB.21 Hardware Security Z,ZK The course deals with hardware resources used to ensure security of computer systems including embedded ones. Students become familiar with the operating principles of cryptographic modules, security features of modern processors, and storage media protection through encryption. They will gain knowledge about vulnerabilities of HW resources, including side-channel attacks and tampering with hardware during manufacture. Students will have an overview of contact and contactless smart card technology including applications and related topics for multi-factor authentication (biometrics). Students will understand methods of efficient implementations of ciphers. BI-IOT.21 5 Internet of Things Z,ZK 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 overview of sensors and actuators, wireless communication technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architectures for different application areas. Within the computer labs, students will gain practical experience with developing simple IoT systems using common development environments (hardware - ARM, ESP, STM; software - Arduino, Raspberry Pi OS) Computer Units Students deepen their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail with the internal structure and organization of computer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using appropriate codes for implementation of multiplication. The organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including codes for error detection and correction for parallel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of communication of the processor with 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 microprogrammed processor simulator and programmable hardware design kits (FPGA).

Z.ZK

The course is focused on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key terms in a domain, the ability to categorize and specify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontological structural modeling in the OntoUML notation. Next, they learn how to express business rules and constraints using the OCL language and foundations of OWL/RDF semantic data representation in the Internet. They also learn the foundations of enterprise engineering, being a discipline for conceptual modelling of enterprises and institutes and their processes. The DEMO method and the BPMN notation

will be taught. The course is designed with the respect to continuation in software implementations. Recommended optional follow-up course: BI-ZPI.

BI-KOM.21

Conceptual Modelling

BI-LOG.21	Mothomotical Logia	l フフレ l	
	Mathematical Logic	Z,ZK	5
	the basics of propositional and predicate logic. It starts from the semantic point of view. Based on the notion of truth, satisfial		
•	formulas are defined. Methods for determining the satisfiability of formulas, some of which are used for automated proving, a	•	
•	plean functions in propositional logic. In predicate logic, the course further deals with formal theories, such as arithmetics, an		e syntactic
	cal logic is demonstrated on the axiomatic system of propositional logic and its properties. Gödel's incompleteness theorems		
BI-MDF.21	Modern Data Formats	KZ	3
-	s to give an overview of commonly used data formats for typical types of data. There will be a description of each data type a		its used for that
	ls 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.	
BI-OOP.21	Object-Oriented Programming	Z,ZK	5
	nming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate togeth		-
•	uainted with the main principles of object-oriented programming and design, used in modern programming languages. The ei	mphasis is on prac	tical 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
will encompass regress	ion and correlation analysis, analysis of variance and non-parametric methods. Students will learn to use the statistical softw	are R and will app	ly the studied
methods on data from r	eal problems.		
BI-PNO.21	Practical Digital Design	KZ	5
	w of the contemporary digital design flow and learn practical skills to use synchronous design techniques. They understand t	ı ı	-
-	hnologies FPGA and ASIC. Students demonstrate practical use of the design techniques in the course project using modern		1
tools.	F		
BI-PAI.21	Law and Informatics	ZK	5
	E 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 or	=	
•	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		
•	ses. Emphasis will also be put on the legal protection of data of the mether, the registration of mether domains and protection 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		-
•	a translation of a text that conforms a given syntax, to a target code and also to create a compiler based on the specification	n. The compiler ca	n translate not
	guage but any text in a language generated by a given LL input grammar.		
BI-PPA.21	Programming Paradigms	Z,ZK	5
The course deals with b	asic paradigms of high-level programming languages, including their basic execution models, benefits, and disadvantages of	particular approa	ches. Functional
programming paradigm	and its basic principles are explained in details. Logic programming is introduced as another way of declarative programming	g. The principles a	e demonstrated
on lambda calculus and	on Lisp (Racket) and Prolog programming languages. Moreover, usage of these principles is demonstrated on modern mair	nstream programm	ing 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 devei	lopment 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		_
		nalysis, crisis mana	agement in a
		-	- 1
project, communication	$argumentation \ and \ meeting \ management. \ Students \ will \ practice \ project \ management \ techniques \ (e.g. \ SWOT \ analysis, \ risk \ management \ and \ project \ management \ techniques \ (e.g. \ SWOT \ analysis, \ risk \ management \ analysis).$	assessment and r	management,
project, communication Gantt charts, resource	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	assessment and restudents who are	nanagement, interested in
project, communication Gantt charts, resource deepening their knowle	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	assessment and restudents who are	nanagement, interested in
project, communication Gantt charts, resource deepening their knowle also suitable for all thos	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 le who will develop software or hardware in the form of team projects.	assessment and r students who are large companies.	management, interested in The course is
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21	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 e who will develop software or hardware in the form of team projects. Network Programming	assessment and restudents who are large companies.	management, interested in The course is
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund	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 le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level prog	assessment and restudents who are large companies.	nanagement, interested in The course is 5 SD sockets. The
project, communication Gantt charts, resource of deepening their knowle also suitable for all thos BI-SIP.21 The course covers functioned and part is devoted	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 le who will develop software or hardware in the form of team projects. Network Programming 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 middle.	assessment and restudents who are large companies. Z	nanagement, interested in The course is 5 SD sockets. The is. The final part
project, communication Gantt charts, resource : deepening their knowle also suitable for all thos BI-SIP.21 The course covers func second part is devoted introduces basic moder	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 le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programging communication protocols and their verification. The third part introduces the principles and applications of middlen models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in consists.	assessment and restudents who are large companies. Z	nanagement, interested in The course is 5 SD sockets. The is. The final part
project, communication Gantt charts, resource of deepening their knowle also suitable for all those BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language	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 le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level program to designing communication protocols and their verification. The third part introduces the principles and applications of middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convenience.	assessment and restudents who are large companies. Z ramming using BS eware technologie omputer labs using	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers function second part is devoted introduces basic moder programming language BI-SP1.21	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 le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programed to designing communication protocols and their verification. The third part introduces the principles and applications of middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in continuous continuous. Team Software Project 1	assessment and restudents who are large companies. Z ramming using BS eware technologie omputer labs using	nanagement, interested in The course is 5 SD sockets. The iss. The final part g a chosen 5
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers function second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or	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 dege outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in the ewho will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programed to designing communication protocols and their verification. The third part introduces the principles and applications of middle normalization are not provided in the environment. Team Software Project 1 experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the	assessment and restudents who are large companies. Z ramming using BS eware technologie omputer labs using KZ le BIE-SWI course	nanagement, interested in The course is 5 SD sockets. The iss. The final part g a chosen 5 that runs
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te	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 the ewho will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programed to designing communication protocols and their verification. The third part introduces the principles and applications of middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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	assessment and restudents who are large companies. Z ramming using BS eware technologie omputer labs using KZ le BIE-SWI course acher, in the role of	nanagement, interested in The course is 5 SD sockets. The iss. The final part g a chosen 5 that runs of the team and
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly	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 dee outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in the ewho will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programed to designing communication protocols and their verification. The third part introduces the principles and applications of middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software	assessment and restudents who are large companies. Z ramming using BS eware technologie omputer labs using KZ le BIE-SWI course acher, in the role of	nanagement, interested in The course is 5 SD sockets. The iss. The final part g a chosen 5 that runs of the team and
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE-	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 the ewho will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programed to designing communication protocols and their verification. The third part introduces the principles and applications of middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course.	assessment and restudents who are large companies. Z ramming using BS eware technologie omputer labs using KZ le BIE-SWI course acher, in the role of artefact will be fu	nanagement, interested in The course is 5 SD sockets. The iss. The final part g a chosen 5 that runs of the team and other developed
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21	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 the ewho will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programming communication protocols and their verification. The third part introduces the principles and applications of middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services	assessment and restudents who are large companies. Z ramming using BS eware technologie computer labs using KZ as BIE-SWI course acher, in the role of artefact will be fu	nanagement, interested in The course is 5 5 5 5 5 5 5 5 5 5 6 7 7 8 7 8 8 8 8 9 8 9 8 9 9 9 9 9 9 9 9
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is	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 the ewho will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convenient. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration.	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using KZ as BIE-SWI course acher, in the role of artefact will be fur atted under the operation of the stated under the stated under the stated under the operation of the stated under the stated under the stated under the operation of the stat	nanagement, interested in The course is 5 5 5 5 5 5 5 5 5 5 6 7 7 8 7 8 8 8 9 8 9 8 9 9 9 9 9 9 9 9 9
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is	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 the ewho will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programming communication protocols and their verification. The third part introduces the principles and applications of middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using KZ as BIE-SWI course acher, in the role of artefact will be fur atted under the operation of the stated under the stated under the stated under the operation of the stated under the stated under the stated under the operation of the stat	nanagement, interested in The course is 5 5 5 5 5 5 5 5 5 5 6 7 7 8 7 8 8 8 9 8 9 8 9 9 9 9 9 9 9 9 9
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is	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 the ewho will develop software or hardware in the form of team projects. Network Programming 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 middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrate course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained.	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using KZ as BIE-SWI course acher, in the role of artefact will be fur atted under the operation of the stated under the stated under the stated under the operation of the stated under the stated under the stated under the operation of the stat	nanagement, interested in The course is 5 5 5 5 5 5 5 5 5 6 7 7 8 7 8 8 8 9 8 9 9 9 9 9 9 9 9 9 9 9
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The	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 the ewho will develop software or hardware in the form of team projects. Network Programming 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 middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrate course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained.	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using KZ as BIE-SWI course acher, in the role of artefact will be fur atted under the opd by practical hand	nanagement, interested in The course is 5 5 5 5 5 5 5 5 5 6 7 7 8 7 8 8 8 9 8 9 9 9 9 9 9 9 9 9 9 9
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers funce second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21	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 the ewho will develop software or hardware in the form of team projects. Network Programming 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 middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrations evolves syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained ructure.	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using ESE examples acher, in the role of artefact will be further the opd by practical hand.	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems s-on experience
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers funce second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course	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 dige outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level prograte designing communication protocols and their verification. The third part introduces the principles and applications of middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 techniques with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrations experiences the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained ructure. Machine Learning 1	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using ESWI course acher, in the role of artefact will be further the opd by practical hand the practical hand the practical hand the practical properties of the practical properties of the practical hand the practical properties of the	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers funce second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in	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 dige outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level prograte designing communication protocols and their verification. The third part introduces the principles and applications of middle models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration courses syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working to introduce students to the basic methods of machine learning. They get theor	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the BIE-SWI course acher, in the role of artefact will be further the open dispractical hand the practical hand t	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers func second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the	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 le who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration of Computer Networks and Services Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working the supervised learning scenario and clustering models in the unsupervised scenario. Students will be aware of the relations	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the BIE-SWI course acher, in the role of artefact will be further the open dispractical hand the practical hand t	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that to project leader, regularly and finished in the BIE-BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandar	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 le who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensic and scikit libraries in Python will be used.	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the BIE-SWI course acher, in the role of artefact will be further actions and the practical hand the properties of the practical hand the properties of the practical hands are ships between moronal data visualizations.	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and tion. In practical
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers funct second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas	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 due outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in le who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrative. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensics and scikit libraries in Python will be used. Machine Learning 2	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the BIE-SWI course acher, in the role of artefact will be further action and the practical hand the properties of the propertie	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and ition. In practical
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers funct second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course	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 due outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in le who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrative. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensic and scikit libraries in Python will be used. Machine Learning 2 is to introduce students to the selected advanced methods of machine learning. In the supervised learning scenario, they, in	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the BIE-SWI course acher, in the role of artefact will be further action and the practical hand the properties of the practical hand the properties of the practical particular, learn keyparticular, learn keyparticu	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and ition. In practical
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers func second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In	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 dige outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in le who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensic and sclikit libraries in Python will be used. Machine Learning 2 is to introduce students to the selected advanced methods of machine learning. In the supervised learning scenario, they, in the u	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the BIE-SWI course acher, in the role of artefact will be further action and the practical hand the properties of the practical hand the properties of the practical particular, learn keyparticular, learn keyparticu	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and ition. In practical
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinfi	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 dige outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in le who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level prog do designing communication protocols and their verification. The third part introduces the principles and applications of middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration controlled by the software syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensic and so introduce students to the selected advanced methods of machine learning. In th	assessment and restudents who are large companies. Zeramming using BS eware technologies omputer labs using KZ are BIE-SWI course acher, in the role of artefact will be further artefact will be further action of the practical hand Z,ZK knowledge of regriships between moronal data visualizational data, learn knowledge, stipped by practicular, learn knowledge, stipped Z,ZK particular, learn knowledge, stipp	nanagement, interested in The course is 5 SD sockets. The is. The final part g a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and del bias and ition. In practical
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers func second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinfe BI-SRC.21	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 the who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrative course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensics and scikit libraries in Python will be used. Machine Learning 2 is	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the seware technologies of the seware technolo	nanagement, interested in The course is 5 D sockets. The is. The final part is a chosen 5 that runs of the team and other developed 5 erating systems is on experience 5 ession and idel bias and ition. In practical is of the same in the same is one in the s
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinfi BI-SRC.21 Students obtain the bas	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 le who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in convironment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrate course syllabus requires the knowledge of network technologies and protocols in the environment of network servers administration of the theoretical knowledge of network technologies and protocols in the environment of network servers administration because syllabus requires the knowledge of network technologies and protocols in the environment of network servers administration and protocols in the environment of network servers administration of computer Networks and Services to despen the theoretical knowledge of network technologies and protocols in the environment of network servers administ	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using KZ respectively by the BIE-SWI course acher, in the role of artefact will be further	nanagement, interested in The course is 5 SD sockets. The state of th
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers func second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinf BI-SRC.21 Students obtain the bas lectures will be experim	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 the who will develop software or hardware in the form of team projects. Network Programming 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 middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrative course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working 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 multidimensics and scikit libraries in Python will be used. Machine Learning 2 is	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using KZ respectively by the BIE-SWI course acher, in the role of artefact will be further	nanagement, interested in The course is 5 SD sockets. The state of th
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinfi BI-SRC.21 Students obtain the bas lectures will be experim course.	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 the who will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programsing communication protocols and their verification. The third part introduces the principles and applications of middle in models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 Rexperience 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services at deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrate ourses syllabus requires the knowledge of network technologies and protocols in the environment of network servers administration of Computer Networks and Services In a course syllabus requires the knowledge of network technologies and protocols in the environment of network servers administration of course students to the basic methods of machine learning. They get theoretical understanding and practical working 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	assessment and restudents who are large companies. Zeramming using BS eware technologies omputer labs using KZ are BIE-SWI course acher, in the role of artefact will be further artefact will be fu	nanagement, interested in The course is 5 D sockets. The is. The final part is a chosen 5 that runs of the team and other developed 5 erating systems is s-on experience 5 ession and idel bias and ition. In practical is sudents get the is sowledge from in the BIE-VES
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers func second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinf BI-SRC.21 Students obtain the bas lectures will be experim course. BI-TAB.21	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 dege outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in the own will develop software or hardware in the form of team projects. Network Programming mental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level progoto designing communication protocols and their verification. The third part introduces the principles and applications of middle on models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services a to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration courses yllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY, Practical skills will be gained ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working in 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 multidimensity and scikit libraries in Python will be used. Machine Learning	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the same as a carefact will be further at a car	nanagement, interested in The course is 5 D sockets. The is. The final part is a chosen 5 that runs of the team and other developed 5 erating systems is son experience 5 ession and idel bias and ition. In practical is sudents get the is sowledge from in the BIE-VES
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinfi BI-SRC.21 Students obtain the bas lectures will be experim course. BI-TAB.21 The goal of the course	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 the own own will develop software or hardware in the form of team projects. Network Programming amental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level programming network applications. It consists of 4 parts. The introduces the principles and applications of middle on models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administred course syllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY. Practical skills will be gained ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working in 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 multidimensic and activative in Python will be used. Machine Learning 2 is to introduce students	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the same as a carefact will be further at a car	nanagement, interested in The course is 5 D sockets. The is. The final part is a chosen 5 that runs of the team and other developed 5 erating systems is son experience 5 ession and idel bias and ition. In practical is sudents get the is sowledge from in the BIE-VES
project, communication Gantt charts, resource deepening their knowle also suitable for all thos BI-SIP.21 The course covers fund second part is devoted introduces basic moder programming language BI-SP1.21 Students gain hands-or concurrently and that te project leader, regularly and finished in the BIE- BI-SPS.21 The aim of the course is Linux and Windows. The with real network infras BI-ML1.21 The goal of this course classification models in variance, and know the demonstrations, pandas BI-ML2.21 The goal of this course and neural networks. In basic principles of reinfi BI-SRC.21 Students obtain the bas lectures will be experim course. BI-TAB.21 The goal of the course	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 dege outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in the own will develop software or hardware in the form of team projects. Network Programming mental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level progoto designing communication protocols and their verification. The third part introduces the principles and applications of middle on models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in or environment. Team Software Project 1 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 teconsults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software SP2 course. Administration of Computer Networks and Services a to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administration courses yllabus requires the knowledge at the level of courses BIE-PSI, BIE-VPS, and BIE-OSY, Practical skills will be gained ructure. Machine Learning 1 is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working in 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 multidimensity and scikit libraries in Python will be used. Machine Learning	assessment and restudents who are large companies. Z ramming using BS eware technologies omputer labs using the same as a carefact will be further at a car	nanagement, interested in The course is 5 D sockets. The is. The final part is a chosen 5 that runs of the team and other developed 5 erating systems is son experience 5 ession and idel bias and ition. In practical is sudents get the is sowledge from in the BIE-VES

Java Technology BI-TJV.21 The goal is to provide knowledge and skills for developing information systems and applications through concepts used in software development and experience with libraries and tools from Java language ecosystem. At the course end, the students are able to develop software systems in Java platform. Computer Networks Technologies Z,ZK 5 The course introduces students with basic and advanced technologies, components, and interfaces of contemporary computer networks at the physical 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 will be demonstrated and with the most important ones students will get hands-on experience. Thematically, the course covers both local and long-range optical networks, Ethernet, modern wireless networks, always with focus on high-speed networks. BI-TIS.21 Information Systems The goal of this course is to familiarise students with the information systems topic and information systems implementation principles. During the course, students are introduced to "on the market" existing types of systems and their usage in specific industry segments. Students are familiarised with the CRM, ERP, MRP and other types of information systems. The fundamental part of the course is the introduction to key ideas of an information system selection, evaluation of information system benefits, ways of information systems implementation and information system implementation based on the project management principles. The emphasis is on the initial customer analysis, customer insight 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 system implementation success. At the end of the course information systems security, operation, support, maintenance, legislation impacts, and government information systems topics are discussed. Design of Web Applications The basic course of web application development. Initially, the students become familiar with HTTP and its possibilities and partly with some properties of language describing the structure (HTML) and presentation of document on the Web (CSS). These skills provide the necessary basis for the development of Web applications, which will be demonstrated in modern libraries facilitate the development of Web pages applications. Server side will be demonstrated on PHP technology using frameworks Symfony 2. Doctrine 2. Developments on the client side will be demonstrated using a JavaScript language with library jQuery and possibly MV* framework React. Introduction to DevOps Z,ZK The course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of systems and services. The course covers the tools to support software development, testing and compilation. It also focuses on tools for automating infrastructure management and building and deploying software to 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 acquainted with modern technologies used in practice. BI-UKB.21 Z,ZK 5 Introduction to Cybersecurity The goal of the course is to provide students with the introduction of basic concepts in modern approach to cybersecurity. Students will get a basic overview of threats in cyberspace and attacker techniques, security mechanisms in networks, operating systems and applications, as well as of basic cyberspace regulations. **Embedded Systems** Students learn to design embedded systems and develop software for them. They get basic knowledge of the most common microcontrollers and embedded processors, their integrated peripheral circuits, programming methods, and applications. They get practical skills with development kits and tools. BI-VDC.21 Virtualization and Data Centers 7.7K 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 and implementation of data center infrastructure, such as various kinds of virtualization and high availability of servers, storages, and software layers. The course guides through data center technologies from private to public and hybrid clouds. Student learn current trends in the architecture of IT infrastructure and its configuration for classic and cloud applications. Students will understand the design, validation, and operation of complex infrastructures for modern applications with respect to scalability and protection against overloads, outages, and data losses. BI-VIZ.21 Data Visualization 5 The course offers an overview of the types and characteristics of data as well as suitable visualization methods. This will aid the students in understanding data, their content and their application in areas such as data mining and machine learning. Within the course, students will be introduced to exploratory data analysis, preprocessing, and ways of visualizing 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 methods to real-world examples in the Python programming language. Selected Topics in Computer Networking The course builds upon the Computer Networks course (BI-PSI), obligatory for the program. Students will learn in detail principles, protocols, and technologies used in modern computer networks from local area networks up to Internet, with focus on switching, routing, security, and virtualization. The emphasis will be on gaining practical experience with real network devices in the lab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, and security, Searching the Web and Multimedia Databases 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-FEM.21 Z,ZK **Fundamentals of Economics** 5 The course allows the students to discover basics of economic theory, which will then be used in subsequent courses of economics and management. It contains a general overview of fundamental microeconomic and macroeconomic topics. Basics of System Control 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. Basics of System Security The goal of the course is to provide introduction to basic concepts in security of computer systems. Further, the course introduces the basics of forensic analysis and related topics such as malware analysis or incident response. After finishing the course student will get both theoretical and practical knowledge in the area of modern operating systems security, as well as skills needed for independent work in the area of operating system security incident analysis. Artificial Intelligence Fundamentals Basic course on introduction to artificial intelligence with emphasis on symbolic techniques. The design of an intelligent agent and the techniques needed to create it will be discussed. especially at the decision-making level. The intelligent agent in the context of the course can be represented for example by a physical robot, but also by a non-physical entity, such as a 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 during the course.

List of courses of this pass:

l l	Name of the course	Completion	Credits
BI-3DT.1	3D Printing	KZ	4
active part in the langu	English language, preparation for the B2 level exam se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement uage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both t ate set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by inc class of the term.	he midterm and the	final term
BI-AAG.21	Automata and Grammars	Z,ZK	5
and regular grammars,	to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite context-free grammars, construction and use of pushdown automata, and translation grammars and transducers. They know the	e hierarchy of forma	al languages
	nderstand the relationships between formal languages and automata. They are introduced to the Turing machine and complexity	1	
BI-ACM	Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
BI-ACM2	Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
BI-ACM3	Programming Practices 3 This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
BI-ACM4	Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
BI-ADU.21 Students will learn the in	Unix Administration ternal structure of the UNIX operating system, with the administration of its basic subsystems and with the security principles. The	Z,ZK y will understand the	5 e differences
	nistrator roles. They will get theoretical and practical knowledge of user management and administration, of users access rights, letwork services and remote access, and in the areas of system deployment and virtualization. In the labs, they will verify the known specific examples from practice.	=	-
BI-ADW.1	Windows Administration This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	Z,ZK	4
BI-AG1.21	Algorithms and Graphs 1 e basics of efficient algorithm design, data structures, and graph theory, belonging to the core knowledge of every computing cu	Z,ZK	5 d partially
develops the knowledg	pe from the course BI-DML.21, in which students acquire the knowledge and skills in combinatorics necessary for evaluating the ins. The course also follows up knowledge from BI-MA1.21, the practical usage of asymptotic mathematics, in particular, the asymptotic mathematics.	time and space co	
=	Algorithms and Graphs 2 d in Czech, introduces basic algorithms and concepts of graph theory as a follow=up on the introduction given in the compulsor data structures and amortized complexity analysis. It also includes a very light introduction to approximation algorithms. For Eng BIE-AG2.21.	=	
BI-ALO	Algebra and Logic		
	The course extends and deepens the study of topics touched upon in the basic course in logic.	Z,ZK	4
BI-AND.21		Z,ZK	4
BI-ANG	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System	KZ ZK	
'	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate	KZ ZK	4
BI-ANG BI-ANG1 BI-ANGK	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN English Language Examination without Preparatory Courses English language, contact preparation for the B2 level exam	KZ ZK SG Z,ZK Z	2 2 2
BI-ANG1 BI-ANGK The content of the coursective part in the language.	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN English Language Examination without Preparatory Courses English language, contact preparation for the B2 level exam se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement uage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both to attempt and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by income	KZ ZK NG Z,ZK Z - students are due he midterm and the	4 2 2 2 to: -Take are in final term
BI-ANG1 BI-ANGK The content of the coursective part in the language.	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN English Language Examination without Preparatory Courses English language, contact preparation for the B2 level exam se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement uage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both that e set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by inclass of the term. Aplication Programming in Java	KZ ZK NG Z,ZK Z - students are due he midterm and the	4 2 2 2 to: -Take are in final term
BI-ANG BI-ANGK The content of the course part in the langulatests with the success results. BI-APJ BI-APS.21	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN English Language Examination without Preparatory Courses English language, contact preparation for the B2 level exam se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement uage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both that est at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by includes of the term. Aplication Programming in Java This course is presented in Czech. Advanced technologies in Java. Architectures of Computer Systems	KZ ZK NG Z,ZK Z students are due the midterm and the dividual teachers du Z,ZK Z,ZK Z,ZK	4 2 2 to: -Take are efinal term ring the firs
BI-ANG BI-ANGK The content of the cours active part in the langutests with the success results and the success results are s	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN English Language Examination without Preparatory Courses English language, contact preparation for the B2 level exam se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement uage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both the set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by includes of the term. Aplication Programming in Java This course is presented in Czech. Advanced technologies in Java.	KZ ZK NG Z,ZK Z - students are due the midterm and the dividual teachers du Z,ZK Z,ZK Z,ZK cial emphasis is given beighes of instruction of the sequential more	4 2 2 2 to: -Take are a final term ring the first 4 5 ven on the a processing del of the
BI-ANG BI-ANGK The content of the cours active part in the languitests with the success rates and a success rates. BI-APJ BI-APS.21 Students will learn the pipelined instruction pronot only in scalar prooprogram. The course fur BI-ARD The subject is designed kits and control varied	The course extends and deepens the study of topics touched upon in the basic course in logic. Programming for the Android Operating System This course is presented in Czech. English Language, Internal Certificate Course information and teaching materials can be found at https://moodle-vyuka.cvut.cz/course/search.php?search=BI-AN English Language Examination without Preparatory Courses English language, contact preparation for the B2 level exam se corresponds to the preparation for the English exam at the B2 level. Requirements for course credit. Academic Achievement uage instructionMeet the requirements for writing assignments - Summary, Abstract, Argumentation PaperSucceed in both to attem the set at 70%80% and over in BOTH tests means ORAL EXAM ONLY (no written part). Requirements will be specified by included the term. Aplication Programming in Java This course is presented in Czech. Advanced technologies in Java. Architectures of Computer Systems of construction principles of internal architecture of computers with universal processors at the level of machine instructions. Specifications on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the princessors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness of other elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory coherents.	KZ ZK NG Z,ZK Z - students are due the midterm and the dividual teachers du Z,ZK Z,ZK Z,ZK Calal emphasis is given beingles of instruction of the sequential more rence and consisted the sequential more rences and consisted the sequential more	2 2 2 to: -Take are a final term ring the firs 4 5 ven on the a processing del of the ency in such

BI-AVI.21	Algorithms visually	Z,ZK	4
	ments other algorithm courses at FIT. It brings knowledge about particular important algorithms from different fields of the computer so 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&l		
Knowledge presente	that make understanding the principles of algorithms easy.	t,iittp://www.aigovi	sion.orgagi,)
BI-AWD.21	Web and Database Server Administration	Z,ZK	5
Students will get ac	equainted with the administration of database and web servers and services. They will be able to install, configure, operate, test, and l		atabase and
	ice systems. The principles will be demonstrated on the PostgreSQL relational database engine and Apache will be used as an exam		
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		- 1
	ileges. 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	KZ	5
	roduced into the field of Big Data processing where nonrelational (NoSQL) database engines are typically used today. The course is for	· · · · · · · · · · · · · · · · · · ·	
-	e students were able to choose suitable tools (mostly open source) and techniques, design and implement a simplest reproducible me		
collection, transform	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.	ai foundation and	presentation
BI-BLE	Blender	Z,ZK	4
	ds knowledge of opensource program Blender from BI-MGA (Multimedia and Graphics Applications) course. It is intended for those in		
animation. It o	offers a complete and practically oriented introduction to Blender environment. Students may continue to BI-PGA (Programming graph	nics applications)	course.
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 t enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvu		
•	I 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 top	-	
· · · · · · · · · · · · · · · · · · ·	nulated more generally, the tasks assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the assigned to him by the supervisor for the semester should be aimed primarily at fine-tuning the semester should be also be a semester should be also be a semester should be a semester should be also be a semester should be a semester sh		
	can be supplemented and approved at the end of the semester.		
BI-CCN	Compiler Construction	Z,ZK	5
	uctory class on compiler construction for bachelor students in computer science. The goal of the class is to introduce basic principles	-	
	nd the design and implementation of programming languages. Seeing and actually understanding self-compilation is the overarching		
BI-CS1	Programming in C# urse is to introduce .NET Framework as a multi-language development platform. Then, programming language C#, its fundamental co	KZ	4 of variables
-	s, loops, definitions and calls of functions will be discussed. Attention is focused on the object oriented programming in C# - class def	= -	
	ods, properties, static members, Garbage Collector, inheritance and polymorphism, collections, delegates, and generics. Debugging		- 1
	well as work with files are emphasized.		
BI-CS2	C# language and data access	KZ	4
	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 techi	•	
-	rying and updating data, integrated directly with the .NET platform languages, which enable LINQ use with Objects, XML and SQL (L	_	
· · · · · · · · · · · · · · · · · · ·). Another objective is the Entity Framework - an object-relational mapper that enables .NET developers to work with relational data u		
(ORM). This part of	f the course introduces Code First, Database First, Model First approaches. The students will also get to know the Conceptual Model	, Storage Model a	nd Mapping
DI 000	(XML description).	1/7	
BI-CS3	Language C# - design of web applications sintroduced to current technologies in web application development on the .NET platform.They will acquire a comprehensive overview or	KZ	4
The students will be	on thisplatform. They will learn to create WebAPI and to use it by client programs.	or the development	. possibilities
BI-DBS.21	Database Systems	Z,ZK	5
	oduced to the database engine architecture and typical user roles. They are briefly introduced to various database models. They lear		databases
	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 funda Iling parallel user access to a single data source, as well as recovering a database engine from a failure. They are briefly introduced t	· ·	
	ases with respect to speed of access to large quantities of data. This introductory-level course does not cover: Administration of datal		- 1
	optimizing database applications, distributed database systems, data stores.		33 3 4 4
BI-DML.21	Discrete Mathematics and Logic	Z,ZK	5
	equainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts fro	=	
Special attention is	paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The cours	e also lays down t	he basics of
BI-EHD	combinatorics and number theory, with emphasis on modular arithmetics. Introduction to European Economic History	Z,ZK	3
ן טויבווט	This course is presented in Czech. However, there is an English variant in the program Informatics (B1801 / 4753).	Ζ,ΖΚ	3
BI-EJA	Enterprise Java	Z,ZK	4
	dvanced technologies in the Java programming language. The focus is on technologies for development of enterprise information systems.		1
	a database and are accessed through the web interface.		
BI-EJK	Enterprise Java and Kotlin	Z,ZK	4
The course is on ac	dvanced technologies in the Java and Kotlin programming languages. The focus is on technologies for developing enterprise informat	ion systems with r	nicroservice
BI-EP1.24	architecture, that can be deployed to the cloud.	KZ	1
DI-CF 1.24	Effective programming 1 The course is taught in Czech.	rv∠	4
BI-EP2	Efficient Programming 2	KZ	4
	ficient Programming 1. Students will practice implementation of algorithms by solving typical problems. Various ways of solving indivi-		1
	with the aim to choose the best one and avoid implementation errors.		

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 aspects 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 the company's life cycle, from the establishment of the company, through the management of property and capital structure, financing of the company, determining the cost function of the company and labor costs, to evaluating the financial health of the company and its eventual rehabilitation or termination. BI-FBI.21 Financial Business Intelligence The aim of the course is to acquaint students primarily with financial accounting as a tool for recording business operations and documents for business analysis, determining its value and other indicators for comparison with other companies and management decision process at the tactical and strategic level. The second view is management accounting as a tool for financial management and prediction of business development. Management accounting allows monitoring of the financial status and performance of business activities over several accounting periods, enables a multidimensional view of business data, enables to control effectively factors affecting the return on invested capital and to use value information to assess options related to future business decisions. The principles of management accounting, described in this course, are the basis of Business Intelligence modules in business information systems, decision support systems, and other knowledge-oriented systems. Fundamentals of Economics BI-FEM.21 7.7K 5 The course allows the students to discover basics of economic theory, which will then be used in subsequent courses of economics and management. It contains a general overview of fundamental microeconomic and macroeconomic topics. BI-FMU Financial and Management Accounting Z,ZK 5 The aim of the course is explanation of basic terms in the theory of accounting, the principles of balancing the property amounts and liabilities in the particular accounting operations. operations in accounts and accounting statements including opening and closing of bookkeeping. The course provides students with a legal modification of bookkeeping, description of economic operations based on current methods of double-entry bookkeeping for enterprising subjects in the Czech Republic. Principles of management accounting are base of Business Inteligence moduls in Business information systems. **BI-GIT** Version control system GIT Students will be introduced to basic principles of version control systems. These principles will be then shown on DCVS Git both theoretically and practically. In this particular system even the implementation details will be shown. Students will be challenged to use Git as users, project managers, team leaders as well as Git server administrators. SW Development Technologies 3 BI-GIT.21 This course is aimed at one of the rudimental team software development technology - version control. To be more specific, we will introduce students to Git, the information 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 This course introduces students to modern and widely used technologies and principles in the area of network infrastructure and traffic monitoring. The monitoring and analysis of network traffic are mandatory skills to network operators (planning and development of resources and infrastructure) and security analysts alike (as a source of information and data for analysis). The goals of the course are to acquaint students with the modern trends and cornerstone principles in the area of monitoring network traffic on a hardware and software level and to develop their practical abilities in this field. **BI-HAS** Human Aspects in Cryptography and Security 7.7K 5 This course is for students interested not only in technical scope of computer science, but also in making products usable - for users and for developers. Students of this course can use their gained knowledge to design, plan and analyse their own projects in the context of human-centered security. BI-HMI History of Mathematics and Informatics Z,ZK 3 This course is presented in Czech. BI-HWB.21 Z,ZK Hardware Security 5 The course deals with hardware resources used to ensure security of computer systems including embedded ones. Students become familiar with the operating principles of cryptographic modules, security features of modern processors, and storage media protection through encryption. They will gain knowledge about vulnerabilities of HW resources, including side-channel attacks and tampering with hardware during manufacture. Students will have an overview of contact and contactless smart card technology including applications and related topics for multi-factor authentication (biometrics). Students will understand methods of efficient implementations of ciphers. BI-IDO.21 Introduction to DevOps The course deals with the topic of DevOps and prepares future developers and administrators for a modern culture of development and operation of systems and services. The course covers the tools to support software development, testing and compilation. It also focuses on tools for automating infrastructure management and building and deploying software to 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 acquainted with modern technologies used in practice. **BI-IOS** Fundamentals of iOS Application Development for iPhone and iPad ΚZ 4 This course is presented in Czech. BI-IOT.21 Internet of Things Z,ZK 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 overview of sensors and actuators, wireless communication technologies designed primarily for this area, and appropriate programming methods. They include an overview of IoT architectures for different application areas. Within the computer labs, students will gain practical experience with developing simple IoT systems using common development environments (hardware - ARM, ESP, STM; software - Arduino, Raspberry Pi OS). BI-JPO.21 Computer Units Z,ZK Students deepen their basic knowledge of digital computer units acquired in the obligatory course of the program (BIE-SAP), get acquainted in detail with the internal structure and organization of computer units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using appropriate codes for implementation of multiplication. The organization of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including codes for error detection and correction for parallel and serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of communication of the processor with 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 microprogrammed processor simulator and programmable hardware design kits (FPGA). BI-KAB.21 Cryptography and Security Z,ZK Students will understand the mathematical foundations of cryptography and gain an overview of current cryptographic algorithms. They will be able to use cryptographic keys and certificates in systems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in applications. Within labs, students will gain practical skills in using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procedures of cryptanalysis Conceptual Modelling BI-KOM.21 Z,ZK The course is focused on developing abstract thinking and precise formulation skills using conceptual models. Students learn skills of discerning key terms in a domain, the ability to categorize and specify correct relations in complex systems of social reality, mostly enterprises and institutions. Students learn basics of ontological structural modeling in the OntoUML notation. Next, they learn how to express business rules and constraints using the OCL language and foundations of OWL/RDF semantic data representation in the Internet. They also learn the foundations of enterprise engineering, being a discipline for conceptual modelling of enterprises and institutes and their processes. The DEMO method and the BPMN notation will be taught. The course is designed with the respect to continuation in software implementations. Recommended optional follow-up course: BI-ZPI.

BI-KOT Programing in Kotlin Z,ZK Kotlin is a modern, statically-styled object-functional language that exploits the extensive Java language ecosystem while delivering a number of advanced language constructions. The language is fully Java compliant and allows for mixed projects that preserve existing parts written in Java, and continue with the development of a modern, object-functional way with minimum of boiler-plate code. Last but not least, Kotlin is suitable for designing of DSLs (Domain-Specific Languages). 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 diversity of the world - examples from anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc ...) will be shown. The course is presented in Czech. BI-LA1.21 Linear Algebra 1 Z,ZK We will introduce students to the basic concepts of linear algebra, such as vectors, matrices, vector spaces. We will define vector spaces over the field of real and complex numbers and also over finite fields. We will present the concepts of basis and dimension and learn to solve systems of linear equations using the Gaussian elimination method (GEM) and show the connection with linear manifolds. We define the regularity of matrices and learn to find their inversions using GEM. We will also learn to find eigenvalues and eigenvectors of a matrix. We will also demonstrate some applications of these concepts in computer science. BI-LA2.21 Linear Algebra 2 Z,ZK 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 prostor v abstraktní 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 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. Ukážeme si také aplikace lineární algebry v r zných oborech. BI-LOG.21 Mathematical Logic 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, satisfiability, logical equivalence, and the logical consequence of formulas are defined. Methods for determining the satisfiability of formulas, some of which are used for automated proving, are explained. This relates to the F vs. NP problem and Boolean functions in propositional logic. In predicate logic, the course further deals with formal theories, such as arithmetics, and their models. The syntactic approach to mathematical logic is demonstrated on the axiomatic system of propositional logic and its properties. Gödel's incompleteness theorems is explained. Mathematical Analysis 1 BI-MA1.21 We begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers. Then we study real sequences and real functions of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This theoretical foundation is then applied to root-finding problems (iterative method of bisection and Newtons method), construction of cubic interpolation (spline), and formulation and solution of simple optimization problems (i.e., the issue of finding extrema of functions). The course is closed with the Landaus asymptotic notation and methods of mathematical description of complexity of algorithms. BI-MA2 21 Mathematical Analysis 2 Z,ZK 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 learn how to integrate by parts and use the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylors theorem to the computation of elementary functions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Master theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the analytical method of localization of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of multivariate functions. BI-MDF.21 Modern Data Formats 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 and the data formats used for that data type along with tools 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 Multimedia and Graphics Applications Students get acquainted with multimedia technologies and applications for 2D/3D bitmap and vector graphics. During the course, current tools for working with images, 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, and compression technologies. They learn to use multimedia transmission and representation systems, including real-time multimedia processing. They understand the principle of operation 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-MIT** Mikrotik technologies 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 the small and middle internet service providers (ISPs). The students learn how to use and create the architectures of the network solutions which are based on the metallic, optical or wireless links and how to administrate and practically deploy them. The successful completion of this subject requires the previous knowledge of elementary computer networks concepts like protocols and technologies of the data-link, network and transport layer of the OSI model. BI-ML1.21 Z.ZK Machine Learning 1 The goal of this course is to introduce students to the basic methods of machine learning. They get theoretical understanding and practical working knowledge of regression and classification models in the supervised learning scenario and clustering models in the unsupervised scenario. Students will be aware of the relationships 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. BI-ML2.21 Machine Learning 2 The goal of this course is to introduce students to the selected advanced methods of machine learning. In the supervised learning scenario, they, in particular, learn kernel methods and neural networks. In the unsupervised learning scenario students learn the principal component analysis and other dimensionality reduction methods. Moreover, students get the basic principles of reinforcement learning and natural language processing. BI-MMP Multimedia team project ΚZ 4 This course is presented in Czech. 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 development, and APIs of selected devices. Z,ZK BI-MVT.21 Modern Visualisation Technologies 5 The goal of the course is to give an overview of modern visualization technologies and their principles, namely technologies related to virtual and augmented reality, visualization on high resolution displays (e.g., SAGE and video mapping) and their applications in practice. Several lectures deal with the content creation for the mentioned technologies, namely fractal and procedural visualization, scientific data visualization, and 3D model scanning. BI-OOP.21 Object-Oriented Programming Z.ZK Object-oriented programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course students get acquainted with the main principles of object-oriented programming and design, used in modern programming languages. The emphasis is on practical techniques for developing software, which includes testing, error handing, refactoring, and application of design pattern.

BI-OPT	Introduction to Optical Networks	Z,ZK	4
•	overview of optical networking technology with the emphasis on practical utilization in Internet and in network infrastructures, on poss	•	
· ·	technology and on their solutions. The course will include the history of optical communications, an overview of passive components	• •	-
	sators, and others), and an overview of active components (optical switches and amplifiers, high-speed coherent transmission syster topics presented at premium research conferences, such as ECOC or OFC. Attention will also be paid to new applications, such as	•	
•	ncy transfer, or sensor networks. The labs will focus on real work with optical components and on measurement of their parameters.		
	from practice.		
BI-ORL	Operations Research and Linear Programming	KZ	5
The subject aims to	introduce students to the issues of operational research and primarily to the practical application of linear programming as a fundar	nental optimization	technique.
Operation	nal research primarily focuses on the use of engineering methods (with a mathematical background) to solve practical problems (suc	h as management	
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		
critical regions, thre	ad scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitionand implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS W		ne to design
BI-PA1.21	Programming and Algorithmics 1	Z,ZK	7
I I	ability to formulate algorithms for solving basic problems and write them in the C language. They understand data types (simple, struc	, ,	
•	ons, concept of recursion. They learn to analyse simple cases of algorithm complexity. They know fundamental algorithms for searchi		
	with linked lists and trees.		
BI-PA2.21	Programming and Algorithmics 2	Z,ZK	7
	nstruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, que	_	
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 progr	ramming,
DI DALO4	copying/moving of objects, operator overloading, inheritance, polymorphism).	71/	_
BI-PAI.21	Law and Informatics urse is to introduce students into the basic legal instruments that they will encounter in their practice. Students will gain knowledge of	ZK	the Czech
	Il be alerted to the pitfalls that await them in business from the point of view of law. They will understand the process of concluding co	-	
•	now their responsibilities in working with the Internet, will be familiar with the institutes of intellectual property law, and will be able to		
and open-source lie	censes. Emphasis will also be put on the legal protection of data on the Internet, the registration of Internet domains and protection a	against their misus	e. Students
will also be alert	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	of real cases from p	oractice.
BI-PGA.21	Programming of Graphic Applications	Z,ZK	5
	tent the possibilities of current professional open-source tools for image editing, video editing, 3D animation (GIMP, Blender) and their		-
data (3D scenes, m	nathematical data). Emphasis will be placed on the possibilities of further enhancement of the presented software tools, both using but by implementation of plugins.	uilt-in scripting lang	guages and
BI-PGR.21	Computer graphics programming	Z,ZK	5
II.	curse, students can program a simple interactive 3D graphical application like a computer game or scientific visualization, design the	'	_
_	nd materials (like wall surface, wood, sky), and set up the lighting. At the same time, they understand the fundamental principles and ter		_
such as graphical p	ipeline, geometric transformations, or lighting model. They gain knowledge allowing orientation in computer graphics and representing	ng solid fundament	tals for your
	oment, e.g., GPU programming and animations. They get used to techniques utilized in geometric modeling, modeling curves and surface		
BI-PHP.1	Programing in PHP	KZ	4
	ught in Czech Main goal of the course is an introduction to PHP - language and technology. Students will learn also best practices a		
development in F	PHP. The course is recommended for students of BIE-WSI-WI.2015 branch of study and do not have required knowledge to register for this course in their 3rd semester of study.	OF BIE-TWA.T. THE	ey sriouid
BI-PJP.21	Programming Languages and Compilers	Z,ZK	5
	isic compiling methods of programming languages. They are introduced to intermediate representations used in current compilers G	!	
	on 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.1	JavaScript Programming	KZ	4
-	course is an introduction to Javascript programming. Students will learn also best practices and will use tool that eases development	•	
recommended for st	tudents of BIE-WSI-WI.2015 branch of study and do not have required knowledge to register for BIE-TWA.1. They should register for the	is course in their 4	th semester
BI-PJS.21	of study. JavaScript Programming	KZ	5
	introduction to Javascript programming. Students will also learn best practices and get acquai nted with tools that make code develo		l
BI-PJV	Programming in Java	Z,ZK	4
Di i ov	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 programm	ning, rule-based pr	ogramming,
	etc.), how to create dynamic interactive applications and visualisations, data processing and presentations.		
BI-PNO.21	Practical Digital Design	KZ	5
	erview 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 C	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		
	igm and its basic principles are explained in details. Logic programming is introduced as another way of declarative programming. Th		
	s and on Lisp (Racket) and Prolog programming languages. Moreover, usage of these principles is demonstrated on modern mainstr		
	such as C++ and Java.		I
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, anal	-	
	ation, argumentation and meeting management. Students will practice project management techniques (e.g. SWOT analysis, risk as ource schedule, resource balancing, network graphs) and creation of project documentation. The course is designed especially for st		-
Janu Unario, 1880	ratos sonegais, resoutos palanonta, network graptis) and disalion of project abountification. The course is designed especially for sti	adding will alt ill	ULUSIEU III

deepening their knowledge outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in large	ge companies. The	course is
BI-PRS.21 Practical Statistics	KZ	5
The students will be introduced to methods of applied statistics. They will learn how to work with various types of data, perform analyses, and choose mod	ı	_
will encompass regression and correlation analysis, analysis of variance and non-parametric methods. Students will learn to use the statistical software	_	
methods on data from real problems.		
BI-PS2 Programming in shell 2	Z,ZK	4
Students gain a general overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In addition		
into shell and some other particular scripting languages and will get practical experience with shell script programming.	, ga a acc	por moigni
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 local networking.	′	_
well. The lectures will be amended by proseminars that introduce students into network programming and demonstrate the abilities of advanced networks.		
	•	Juuenis
practically verify configurations and management of network devices in the lab within the environment of the operating systems Linux ar		
BI-PST.21 Probability and Statistics	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 variables. The	=	
models of random variable distributions and solve applied probabilistic problems in informatics and computer science. Using the statistical induction t	=	-
estimations of unknown distributional parameters from random sample characteristics. They will also be introduced to the methods for testing statistical	hypotheses and d	etermining
the statistical dependence of two or more random variables.		
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	processing. The d	ifferences
between philosophy of programming in Python and in other programming languages will be explained. Each topic is prepared for students in the format	of a Jupyter noteb	ook, 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 semester		
the semester.		
BI-QAP Quantum algorithms and programming	KZ	5
Course aims at giving students hands-on experience with quantum computers and their programming. We focus on fundaments of quantum mechanics, or		_
are based, and algorithms showing advantages and limitations of quantum computing. During tutorials students work in open-source software developm	•	•
on Python language. 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-VMM		
might be an advantage. No previous knowledge of physics is assumed.	and expendence w	iui i yuioii
	KZ	1
BI-QUA Quality Assurance	ı	. 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 of		
development and 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 und	der 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 arithr	netic-logic unit, co	ontrollers,
nemory, I/O communication, methods of data transfers between the units. The logic design and the implementation of a program-controlled simple proces		
in the labs using programmable circuits (FPGA), a single-chip microcomputer, and modern design (EDA) tools.		
BI-SCE1 Computer Engineering Seminar I	Z	4
The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	_	
are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the		
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 teachers	•	
semester.	s. The topics are in	ew ioi eacii
	7	4
BI-SCE2 Computer Engineering Seminar II	Z	4
The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to		
are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the	•	
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 teachers	s. The topics are n	ew for each
semester.	ľ	
BI-SEP World Economy and Business	Z,ZK	4
This course is presented in Czech. The course introduces students of technical university to the international business. It does that predominantly by co	mparing individua	l countries
and key regions of world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as	ndexes of econom	ic freedom,
corruption and economic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of dis	scussions based o	n individual
readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite.		
BI-SIP.21 Network Programming	Z	5
The course covers fundamental topics of programming network applications. It consists of 4 parts. The introductory part is focused on low-level program	ı ming using BSD so	
second part is devoted to designing communication protocols and their verification. The third part introduces the principles and applications of middlewa		
introduces basic modern models of distributed computing - P2P and blockchain. All topics will be first explained theoretically and then practices in con	-	-
programming language environment.		
BI-SKJ.21 Scripting Languages	Z,ZK	4
Students gain a general overview of available scripting languages, their syntax, semantics, programming style, data structures, pros and cons. In addition		-
into shell and some other particular scripting languages and will get practical experience with shell script programming.	iii, tiley gaili a dee	per maigni
		1
BI-SOJ Machine Oriented Languages	7.71/	4
Students of the course will gain an ability to create their own programs in the assembly language of the most common PC platform focusing on optimal use	Z,ZK	
and officient appropriate of poftware with hardware. Next, there will be discussed v00 anadition of the analysis of 00 from the analysis of 10	e of microprocesso	
and efficient cooperation of software with hardware. Next, there will be discussed x86 specifics of the majority of OSes from the application point of view lin	e of microprocesso	
This knowledge will be used during reverse engineering, optimization, and evaluation of code security.	e of microprocesso ked to higher level	languages.
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1	e of microprocesso ked to higher level	languages.
This knowledge will be used during reverse engineering, optimization, and evaluation of code security.	e of microprocesso ked to higher level	languages.
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher	e of microprocesso ked to higher level KZ BIE-SWI course t er, in the role of the	5 hat runs e team and
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the	e of microprocesso ked to higher level KZ BIE-SWI course t er, in the role of the	5 hat runs e team and
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher	e of microprocesso ked to higher level KZ BIE-SWI course t er, in the role of the	5 hat runs e team and
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher project leader, regularly consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software arter	e of microprocesso ked to higher level KZ BIE-SWI course t er, in the role of the	5 hat runs e team and
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher project leader, regularly consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software and finished in the BIE-SP2 course.	e of microprocesson ked to higher level KZ BIE-SWI course ter, in the role of the fact will be further	5 hat runs e team and developed
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher project leader, regularly consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software and finished in the BIE-SP2 course. BI-SP2.21 Team Software Project 2	KZ BIE-SWI course ter, in the role of the state will be further	5 hat runs e team and developed 5 urse project.
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Team Software Project 1 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher project leader, regularly consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software and finished in the BIE-SP2 course. BI-SP2.21 Team Software Project 2 Students gain hands-on experience with the iterative development process while working on a large-scale software project. The first iteration is the result of the support of the software project.	KZ BIE-SWI course ter, in the role of the state will be further KZ of the BIE-SP1 course ter, in teams of 4-6 per interest.	5 hat runs e team and developed 5 urse project.
This knowledge will be used during reverse engineering, optimization, and evaluation of code security. BI-SP1.21 Students gain hands-on experience with the analysis, design, and prototyping of a large-scale software system. Theoretical support is provided in the concurrently and that teaches students necessary techniques and principles. Teams consisting of 4-6 students will work on a specific project. The teacher project leader, regularly consults with the team (at the seminars) both the formal and material aspects of the software design. The resulting software and finished in the BIE-SP2 course. BI-SP2.21 Team Software Project 2 Students gain hands-on experience with the iterative development process while working on a large-scale software project. The first iteration is the result of the software, in this follow-up, the functionality, testing, and documentation of the software system being developed will be emphasized. Students will work	KZ BIE-SWI course ter, in the role of the state will be further KZ of the BIE-SP1 course ter, in teams of 4-6 per interest.	5 hat runs e team and developed 5 urse project.

BI-SPS.21	Administration of Computer Networks and Services	Z,ZK	5
	rse is to deepen the theoretical knowledge of network technologies and protocols in the environment of network servers administrate		_
	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		
	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	1	gram unites,
	queries, OLAP support, object-relational constructions. Part of the course is dedicated to practical database optimization from the point		-
	exes, clusters, index-organized tables, and materialized views. as well as from the point of view query optimization. Execution plan ar	-	
will be discusse	ed. Lectures will usually discuss SQL standard, but many features will be demonstrated on Oracle DBMS. Seminars are based on Ora	acle DBMS and pa	rtially on
	PostgreSQL.		
BI-SRC.21	Real-time systems	Z,ZK	5
Students obtain t	he basic knowledge in the real-time (RT) system theory and in the design methods for RT systems including the dependability issues	. Theoretical know	edge from
lectures will be ex	perimentally verified in computer labs. The course is mainly focused on embedded RT systems, therefore the design kits in the lab are	e the same as in th	e BIE-VES
	course.		
BI-ST1	Network Technology 1	Z	3
The subject is o	riented to providing the students basic information and practical skills from the area of digital and IP networks. The subject is acredited	d under the Cisco	Netacad -
	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
Students will further	er enhance their knowledge acquired from previous BI-ST1 and BI-ST2 courses. Principles of routing and switching presented during E	BI-ST1 and BI-ST2	courses will
get further exten	ded in the course. Students will be able to start fine-tune protocols' settings to gain certain advantages like increased efficiency, predi	ictability, extension	beyond a
	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		
· ·	le Access) which radically differs from well-known Ethernet (broadcast) type of networks. Students will also manage router and switch		-
recoveries, and er	nergency procedures. Also the security aspect is treated; students will learn possible intra- and inter-network attacks and the mitigation network running.	on ways while mair	itaining the
BI-STO		7 71/	4
	Storage and Filesystems	Z,ZK	4
The student will lea	arn principles and current solutions of storage systems architecture. The module explains principles of data store, protection, and archi load balancing and high availability.	iviliy, as so as sioi	age scaling,
BI-SVZ.21		Z,ZK	5
	Machine vision and image processing are becoming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluate in	'	_
-	s to different types of camera systems and a variety of methods for image and video processing. The course is focused on practical use	_	
miroddood diddoni	problems of practice that the graduates may encounter.	or camora cyclom	o loi oolviilig
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-	•	
using the visual la	nguage UML for modeling and solving software problems. Students learn the basics of object-oriented analysis, architecture design a	and testing. Within	the course,
st	udents also gain a theoretical basis in the field of project management, estimation of costs of software projects, and methods of their	development.	
BI-TAB.21	Applications of Security in Technology	Z,ZK	5
The goal of the co	ourse is to introduce students to selected topics from cybersecurity technical applications that are utilized in different industries. Stude	nts get a broader	overview of
	cybersecurity applications and extend their knowledge from the cryptology, the secure code, and system, network, and hardware	security.	
BI-TDA	Test driven architecture	KZ	4
The course is for	cused on practical examples of how to develop, test, and deploy software with tools like GitLab, Docker, Kubernetes, and more that ar	re well known in the	e DevOps
world. This co	ourse has a strong connection on courses like BI(E)-SI1 and BI(E)-SI2. The main goal of this course is to learn by examples that occu	r in the semester p	roject.
BI-TDP.21	Documentation and Presentation	KZ	3
The course is focu	sed on the basics of creating electronic documentation with emphasis on the creation of technical reports of a larger scope, typically fi	nal university these	es. Students
	of a technical report in the LaTeX system, process an electronic presentation using the LaTeX Beamer system, and practically prese		
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
This course is pres	sented in Czech. This course gives basics of programming in TeX (plain TeX, ConTeXt, LaTeX, OpTeX, LuaTeX). Te second part of the	course focuses on	typographic
DI TIO 04	rules.	7 714	
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 course is to familiarise students with the information systems topic and information systems implementation principles. During the course is to familiarise students with the information systems topic and information systems implementation principles. During the course is to familiarise students with the information systems topic and information systems implementation principles. During the course is to familiarise students with the information systems topic and information systems implementation principles.		
	xisting types of systems and their usage in specific industry segments. Students are familiarised with the CRM, ERP, MRP and other		-
	ital part of the course is the introduction to key ideas of an information system selection, evaluation of information system benefits, wa Id information system implementation based on the project management principles. The emphasis is on the initial customer analysis,	=	-
	is better to implement any existing information system or to develop a new one from scratch. These factors determine the information sy		
	of the course information systems security, operation, support, maintenance, legislation impacts, and government information system	· ·	
BI-TJV.21	Java Technology	Z,ZK	5
	ide knowledge and skills for developing information systems and applications through concepts used in software development and exp		_
3::- : :=	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
	uces students with basic and advanced technologies, components, and interfaces of contemporary computer networks at the physical	,	
	ures provide theoretical foundations of these technologies and explain relevant physical principles. In the labs, the respective technologies	=	-
with the most impo	ortant 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.		

BI-TS1 Theoretical Seminar I Ζ Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical reading group. The students are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a work with scientific papers and other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar. BI-TS2 Theoretical Seminar II 7 Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical reading group. The students are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a work with scientific papers and other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar. BI-TS3 Theoretical Seminar III Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical reading group. The students are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a work with scientific papers and other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar. BI-TS4 Theoretical Seminar IV Theoretical seminar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical reading group. The students are treated individually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a work with scientific papers and other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar. User Interface Design Z,ZK Students gain a basic overview of methods for designing and testing common user interfaces. They get experience to solve the problems where software and other products do not communicate with the user optimally, since the needs and characteristics of users are not taken into account during product development. Students gain an overview of methods that bring users into the development process to ensure optimal interface for them. BI-TWA.21 Design of Web Applications The basic course of web application development. Initially, the students become familiar with HTTP and its possibilities and partly with some properties of language describing the structure (HTML) and presentation of document on the Web (CSS). These skills provide the necessary basis for the development of Web applications, which will be demonstrated in modern libraries facilitate the development of Web pages applications. Server side will be demonstrated on PHP technology using frameworks Symfony 2, Doctrine 2. Developments on the client side will be demonstrated using a JavaScript language with library jQuery and possibly MV* framework React Technological Fundamentals of Computers BI-TZP.21 Z,ZK Students get acquainted with the fundamentals of digital and analog circuits, as well as basic methods of analyzing them. Students learn how computer structures look like at the lowest level. They are introduced to the function of a transistor. They will understand why processors generate heat, why cooling is necessary, and how to reduce the consumption; what the limits to the maximum operating frequency are and how to raise them; why a computer bus needs to be terminated, what happens if it is not; how a computer power supply looks like (in principle). In the labs, students model the behavior of basic electrical circuits in SW Mathematica. 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 overview of threats in cyberspace and attacker techniques, security mechanisms in networks, operating systems and applications, as well as of basic cyberspace regulations. BI-ULI Introduction to Linux 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 familiar with basic commands and techniques of a Unix-like system. Topics can be studied first theoretically and then practically verified in a virtual machine (terminal) BI-UOS.21 Unix-like Operating Systems ΚZ Unix-like operating systems represent a large family mostly open-source codes that kept bringing during the history of computers efficient innovative functions of multiuser operating systems for computers and their networks and clusters. The most popular OS today, Android, has a unix kernel. Students get overview of basic properties of this OS family, such as processes and threads, access rights and user identity, filters, or handling files in a file system. They learn to use practically these systems at the level of advanced users who are not only able to utilize powerful system tools that are available to users, but are also able to automatize routine agenda using the unix scripting interface, called shell 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 the basic courses, we approach the issue from applications to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basic data structures. Furthermore, with the active participation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) informatics. Areas from which we will select problems to be solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimization and more. Students will also try to implement solutions to the studied problems with a special focus on the effective use of existing tools. BI-VDC.21 Virtualization and Data Centers Z,ZK The aim of the course is to familiarize students with technology basis of cloud computer systems. It shows principles and techniques used in design and implementation of data center infrastructure, such as various kinds of virtualization and high availability of servers, storages, and software layers. The course guides through data center technologies from private to public and hybrid clouds. Student learn current trends in the architecture of IT infrastructure and its configuration for classic and cloud applications. Students will understand the design, validation, and operation of complex infrastructures for modern applications with respect to scalability and protection against overloads, outages, and data losses. BI-VFS 21 **Embedded Systems** Students learn to design embedded systems and develop software for them. They get basic knowledge of the most common microcontrollers and embedded processors, their integrated peripheral circuits, programming methods, and applications. They get practical skills with development kits and tools. **BI-VHS** Virtual game worlds The course leads students to create a complex virtual world. The course is a continuation of basic graphical courses (MGA, PGR, BLE,). This current students knowledge is furthermore complemented by the theory of game design, principles of writing dialogues and characters in order to create a functional and complex virtual world. The course can be followed by the course MI-PVR with the task of converting scenes and their dynamics into a fully virtual environment suitable for VR devices BI-VHS.21 Virtual game worlds In the course students learn methods to create a complex virtual world. It is a follow-up course of basic courses of the PG specialization (BIE-MGA, BIE-PGR). Students gain knowledge of the theory of game design, of principles of writing dialogues and characters in order to create a functional virtual world. Within the labs they get practical skills within team development work on the semester project. BI-VIZ.21 **Data Visualization** ΚZ The course offers an overview of the types and characteristics of data as well as suitable visualization methods. This will aid the students in understanding data, their content and their application in areas such as data mining and machine learning. Within the course, students will be introduced to exploratory data analysis, preprocessing, and ways of visualizing 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 methods to real-world examples in the Python programming language. BI-VMM Selected Mathematical Methods Z,ZK The lecture begins with an introduction to the analysis of complex functions of a complex variable. Next, we present the Lebesgue integral. We then address Fourier series and their properties. Further, we introduce and study the properties of the Discrete Fourier Transform (DFT) and its fast implementation (FFT). We discuss the wavelet transform. We examine the linear programming problem in more detail and its solution using the Simplex algorithm. Each topic is demonstrated with interesting examples.

BI-VPS.21	Selected Topics in Computer Networking	Z,ZK	5
ha courea huilde un	on the Computer Networks course (BI-PSI), obligatory for the program. Students will learn in detail principles, protocols, and technologi	,	1
	area networks up to Internet, with focus on switching, routing, security, and virtualization. The emphasis will be on gaining practical e		
	ces in the lab and learning important methods of local area and wide area networks from the viewpoint of functionality, performance, a	-	
BI-VR1	Virtual reality I	KZ	4
	Il Reality (VR), virtual reality operating system and virtual reality creation. Another objective is to meet the rules and requirements of vi		1
	s on the ways of teaching using virtual reality technologies and interactive activities in educational virtual 3D worlds. It improves comp		
	and shared social activities.		
BI-VR2	Virtual reality II	KZ	3
ontinuation of the c	course Virtual Reality I. The new course focuses on collaborative telepresence, spatial computing and social life of avatars. The objecti	ve is to develop	application
	for computer science and gamification in various social metaverse and desktop engines.		
BI-VWM.21	Searching the Web and Multimedia Databases	Z,ZK	5
-	overview about search techniques in the web environment that is interpreted as a very large distributed and heterogeneous storage		
	formation about search techniques in text and hypertext documents (the web pages themselves) and about feature extraction from we		
owleage of similar	ity search in multimedia databases (generally in collections of unstructured data). They also learn techniques for programming web sear	cn engines for ti	ne mention
DI ZIVC	data types (documents).		1
BI-ZIVS	Intelligent Embedded System Fundamentals d system fundamentals course is focused on high-level technology embedded systems integrating artificial intelligence. The aim of the	KZ	4
_	bot control and development of applications in a graphical development environment. Lectures provide fundamentals of motion control		
	igation and development tools. In labs, students program a set of basic task by using the robot simulator and real hardware to get pra		
oaooo,o.	technologies.	ouear experient	
BI-ZNF	PHP Framework Nette - basics	KZ	3
	e basics of PHP framework Nette. They will learn how to practically work with MVP architecture and various libraries of this Czech population.		_
J	knowledge should serve for the efficient creation of a web backend in PHP language.		
BI-ZPI	Process engineering	KZ	4
	indamentals of process engineering in this subject. Students will get necessary foundations for understanding formal principles of pro	cess modelling	and they
arn basics of the u	sed notations (UML, BPMN, BORM). The focus in this subject lies in training of practical skills of formalisation and modelling of business	ess processes u	ising mod
ASE tools. The role	e of process engineering for information systems development is discussed as well as its importance in the overall context of informat	ion and busines	ss strategy
	an enterprise.		
BI-ZRS.21	Basics of System Control	Z,ZK	5
_	n introduction to the field of automatic control. Students will gain knowledge in this rapidly evolving field of great future. We will focus of	-	-
•	ng and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems, description r		
=	systems analysis and design verification, simple PID feedback, PSD, and fuzzy controllers. Students will learn the methods of creating		-
	near dynamic systems analysis and design verification and simple PID feedback, PSD, and fuzzy controllers. Attention is also given to		
ontroi ioops, issues	s of stability in control systems, single and continuous adjustment of the controller parameters, and certain aspects of the industrial in and digital controllers and PLC control.	ipiementation c	r continuo
BI-ZS10	Bachelor internship abroad for 10 credits		
DI-ZOTU I		7	
		Z	_
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	arch institution	
Each student can dear	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resense of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional	earch institution	Before the
Each student can on the student can on the student can on the student can be stud	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or rese	earch institution al content and e spond to 4 wee	Before the extent of the ks of full-tile
Each student can on the student can on the student can on the student can be stud	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corre	earch institution al content and e spond to 4 wee	Before the extent of the ks of full-tire
Each student can on the student can on the student can on the student can be student can be student can be student can be student.	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into	earch institution al content and e spond to 4 wee	Before the extent of the ks of full-tile
Each student can on the conternship the Dear ernship. Auxiliary on ployment with a form	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line.	earch institution al content and e spond to 4 wee two subjects if t	Before the extent of the ks of full-tile he interns
Each student can of the conternship the Dear ernship. Auxiliary on ployment with a form BI-ZS20 Each student can of the conternship the Dear	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e	Before the extent of the extent of the ks of full-time interns 20 Before the extent of the
Each student can of the conternship the Dear ernship. Auxiliary on ployment with a form BI-ZS20 Each student can of the conternship the Dear	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or research.	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e	Before the extent of the extent of the ks of full-time interns 20 Before the extent of the
Each student can of ternship the Dear ernship. Auxiliary on ployment with a form BI-ZS20 Each student can of ternship the Dear ernship. Auxiliary of the can be considered to the can be considered	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee	Before the extent of the ks of full-ticks of full-ticks of full-ticks of the interns 20 Before the extent of the ks of full-ticks
ach student can deternship the Dear ernship. Auxiliary of apployment with a formal student can deternship the Dear ernship. Auxiliary of apployment with a formal student with a formal student with a formal student can de	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line.	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t	Before the extent of the ks of full-ticks of full-ticks of full-ticks of the interns 20 Before the extent of the ks of full-ticks
ach student can deternship the Dear ernship. Auxiliary of apployment with a formal student can deternship the Dear ernship. Auxiliary of apployment with a formal student with a formal student can deternship. Auxiliary of apployment with a formal student can deternship. Auxiliary of apployment with a formal student can detern ship. Auxiliary of apployment with a formal student can detern ship.	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t	Before the extent of the extent of the sof full-tile he interns 20 Before the extent of the extent of the extent of the sof full-tile he interns
Each student can on the conternship the Dear ernship. Auxiliary on ployment with a formal student can on the conternship. Auxiliary on ployment with a formal student can one can be student can be	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved.	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution	Before the extent of the extent of the stent of the extent of the stent of the sten
Each student can on the conternship the Dear ernship. Auxiliary on ployment with a formal student can on the conternship. Auxiliary on ployment with a formal student can on the conternship the Dear ernship the Dear ernship the Dear ernship the Dear enternship the Dear enternship the Dear	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved to the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content.	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e arch institution al content and e	Before the extent of the extent of the extent of the sof full-tile he interns 20 Before the extent of the sof full-tile he interns 30 Before the extent of the extent
Each student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student can of ternship the Dear ernship. Auxiliary in ternship the Dear ernship. Auxiliary in the ployment with a feach student can of ternship. Auxiliary in the ployment with a feach student can of ternship. Auxiliary in the ployment with a feach student can of ternship. Auxiliary in the ployment with a feach student can be a feach student	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved in the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship of the foreign scientific and/or reserved in the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspondences BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspondences BI-ZS10, BI-ZS20, BI-ZS30 are used u	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee spond to 4 wee spond to 4 wee	Before the extent of the extent of the stent of the set of full-tine interns 20 Before the extent of the set of full-tine interns 30 Before the extent of the set of the set of the extent of the extent of the extent of the set of full-tine extent of full-tine extent of the set of full-tine extent of full-tine extent of the set of full-tine extent of full-tine extent of full-tine extent of the set of full-tine extent of full-
ach student can obternship. Auxiliary opposed by the Dear student can obternship the Dear ernship. Auxiliary opposed by the Dear ernship. Auxiliary opposed by the Dear ernship the Dear et ernship the Dear ernship the Dear ernship. Auxiliary opposed by the Dear ernship.	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved in the professional content. The student must provide evidence of the professional 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 the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 the professional content. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into the professional content. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into the professional content.	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee spond to 4 wee spond to 4 wee	Before the extent of the extent of the stent of the set of full-tine interns 20 Before the extent of the set of full-tine interns 30 Before the extent of the set of the set of the extent of the extent of the extent of the set of full-tine extent of full-tine extent of the set of full-tine extent of full-tine extent of the set of full-tine extent of full-tine extent of full-tine extent of the set of full-tine extent of full-
ach student can obternship. Auxiliary opposed by a ployment with a few student can obternship. Auxiliary opposed by a ployment with a few student can obternship. Auxiliary opposed by a ployment with a few student can obternship the Dear ernship. Auxiliary opposed by a ployment with a few student with a few student can obternship. Auxiliary opposed by a ployment with a few student with a few	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits	earch institution al content and e spond to 4 wee two subjects if the spond to 4 weekles in the spond	Before the extent of the extent of the extent of the sof full-tihe interns 20 Before the extent of the sof full-tihe interns 30 Before the extent of the e
BI-ZS30	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Basics of System Security	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t	Before the extent of the extent of the extent of the ks of full-tihe interns 20 Before the extent of the so of full-tihe interns
Each student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student can of ternship. Auxiliary in ployment with a feach student with a feach student can of ternship. Auxiliary in ployment with a feach student can of the student can be student can be student can be student.	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved to the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved in the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional 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 institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved in the professional content. The student must provide evidence of the professional contents are provide evidence of the professional content. The student must provide evidence of the professional contents are provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z,ZK analysis and re	Before the extent of the exten
ach student can obternship. Auxiliary opposed in the pear of the p	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea on the filt, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provi	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z,ZK analysis and re	Before the extent of the sextent of the sextent of the sextent of the sextent of the extent of the e
Each student can obternship. Auxiliary enployment with a feach student can obternship auxiliary enployment with a feach can obtern auxiliary enployment	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence or study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor internship at a foreign university or other foreign scientific and/or reservence within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the	earch institution all content and easpond to 4 weetwo subjects if the spond to 5 km analysis and responding systematics.	Before the extent of the sex of full-time interns 20 Before the extent of the extent
Each student can deternship. Auxiliary exployment with a feach student can deternship. Auxiliary exployment with a feach student can deternship. Auxiliary exployment with a feach student can deternship the Dear ernship. Auxiliary exployment with a feach student can deternship. Auxiliary exployment with a feach student can deternship. Auxiliary exployment with a feach student can deternship. Auxiliary exployment with a feach student can detern ship. Auxiliary exployment with a feach student can detern ship. Auxiliary exployment with a feach student can detern ship. Auxiliary exployment with a feach student can detern ship. Auxiliary exploration of the coulculary exploration.	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence in the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponded in the exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits B	earch institution all content and easpond to 4 wee two subjects if the spond to 5 km analysis and respond to 5 km analysis and responding systematical content and 6 km analysis and responding systematical content and content an	Before the extent of the sex of full-time interns 20 Before the extent of the extent
ach student can deternship. Auxiliary exployment with a feather student can deternship the Dear ernship. Auxiliary exployment with a feather student can deternship. Auxiliary exployment with a feather student can detern ship. Auxiliary exployment with a feather student can detern ship. Auxiliary exployment with a feather student can detern ship. Auxiliary exployment with a feather student can detern ship. Auxiliary exployment with a feather student can detern ship. Auxiliary exploration of the course of the course on introduction of the course	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence or study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor internship at a foreign university or other foreign scientific and/or reservence within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence within his / her bachelor's study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the	earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z earch institution al content and e spond to 4 wee two subjects if t Z,ZK analysis and re operating syste Z,ZK o create it will b	Before the extent of the sex of full-time he interns 20 Before the extent of the exte
ach student can deternship. Auxiliary exployment with a feather student can deternship the Dear ernship. Auxiliary exployment with a feather student can deternship. Auxiliary exployment with a feather student can detern as malware are graphically.	conce within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents as student can earn for one internship in 18 KOS. Every 10 credits correspond this institution. The maximum number of credits as student can earn for one internship or the foreign scientific and/or research or the first of the professional content. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional content. The student must provide evidence of the professional contents. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of th	earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution and content and earpond to 4 week two subjects if the earch institution and content and early subjects if the earch institution and content and early subjects if the earch institution and content and early subjects in the early subjects in the earch institution and early subjects in the earch institution and early subjects in the	Before the extent of the sex of full-time interns 20 Before the extent of the extent
ach student can deternship. Auxiliary exployment with a feather student can deternship. Auxiliary exployment with a feather ship. Auxiliary exploration of the course of t	conce within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits and the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content in the provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the profess	earch institution all content and easpond to 4 weetwo subjects if the spond to 5 km and 1 content and 6 km and 1 content and 1 co	Before the extent of the sex of full-time he interns 20 Before the extent of the exte
Each student can onternship the Dear ernship. Auxiliary enployment with a feach student can onternship the Dear ernship. Auxiliary enployment with a feach student can onternship the Dear ernship. Auxiliary enployment with a feach student can onternship. Auxiliary enployment with a feach student can onternship. Auxiliary enployment with a feach student can enternship. Auxiliary enployment with a feach student can enternship the course of the course on introduced the course on introduced the course on introduced the course on introduced the course of the course of the course on introduced the course of th	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or resea of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding in the student must provide evidence of the professional content. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 30 credits. This amount can be divided into exceeds BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship in IS KOS. Every 10 credits correctly internship internship in IS KOS. Every 10 credits correctly internship internship in IS KOS. Ever	earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution al content and earpond to 4 week two subjects if the earch institution and content and earpond to 4 week two subjects if the earch institution and content and early subjects if the earch institution and content and early subjects if the earch institution and content and early subjects in the early subjects in the earch institution and early subjects in the earch institution and early subjects in the	Before the extent of the exten
Each student can onternship the Dear ternship. Auxiliary in ployment with a few student can onternship the Dear ternship. Auxiliary in ployment with a few student can onternship the Dear ternship. Auxiliary in ployment with a few student can onternship. Auxiliary in ployment with a few student can onternship. Auxiliary in ployment with a few student can onternship. Auxiliary in ployment with a few student can can be student can onternship. Auxiliary in ployment with a few student can can be student can can be student can be s	conce within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservence of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The maximum number of credits a student can earn for one internship in IS KOS. Every 10 credits correctly in the student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content in the student must provide evidence of the professional content. The student must provide evidence of the professional content in the student must provide evidence of the professional content. The student must provide evidence of the professional content in the student must provide evidence of the professional content. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional contents. The student must provide evidence of the professional con	earch institution all content and easpond to 4 weetwo subjects if the spond to 5 km and 1 content and 6 km and 1 content and 1 co	Before the extent of the exten
BI-ZS30 Each student can deternship. Auxiliary employment with a feathernship the Dear ernship. Auxiliary employment with a feathernship.	conce within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponded in the exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponded by the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits	parch institution all content and a spond to 4 wee two subjects if the spond to 5 kg. Z.X. The spond to 5 kg. The spond to 6 kg. The spond to 6 kg. The spond to 6 kg. The spond to 7 kg. The spond to 8 kg. The spond to 8 kg. The spond to 8 kg. The spond to 9 k	Before the extent of the sextent of the extent of the extent of the sextent of the extent of the extent of the sextent of the extent
Each student can deternship the Dear ernship. Auxiliary employment with a few student can deternship the Dear ernship. Auxiliary employment with a few student can detern the property of the poar ernship. Auxiliary employment with a few student can deternship the Dear ernship. Auxiliary employment with a few student can detern the poar ernship. Auxiliary employment with a few student can detern the property of the goal of the course on introduction as a vimal was a vimal expecially at the dear as a vimal employment.	conce within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional courses BI-ZS10, BI-ZS20, BI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspondent to the professional content. The student must provide evidence of the professional content in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professio	parch institution all content and a spond to 4 wee two subjects if the spond to 5 kg. ZK analysis and respond to 6 kg. ZK analysis and respond to 7 kg. ZK analysis and respond to 8 kg. ZK analysis and respond to 9 kg. ZK analysis and respond to 9 kg. ZK analysis and respond to 9 kg. ZK as but interested	Before the extent of the exten
Each student can onternship. Auxiliary enployment with a feach student can onternship. Auxiliary enployment with a feach student can onternship. Auxiliary enployment with a feach student can onternship the Dear ernship. Auxiliary enployment with a feach student can onternship. Auxiliary enployment with a feach student can onternship the course on introduction of the course of	ance within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional contents of the internship in IS KOS. Every 10 credits correctly institution. The maximum number of credits a student can earn for one internship in IS KOS. Every 10 credits correctly institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence and evaluation of the internship in IS KOS. Every 10 credits correctly internship abroad for 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits Bachelor internship abroad for 30 credits. This amount can be divided into exceeds Bi-ZS10, Bi-ZS20, Bi-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correctly internship as a foreign internship in 30 credits. This amount can be divided into exceeds the academic year's dead-line. Basics of System Security Basics of system security incident analysis. Artificial Intelligence Fundamentals Condition to artificial intelligence w	parch institution all content and a spond to 4 wee two subjects if the spond to 5 kg. Z/Z/K analysis and reoperating system Z/Z/K as but interested to fine class is	Before the extent of the exten
Each student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship the Dear ernship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can detern and the goal of the course as malware are specially at the deas a view BI-ZWU BIE-CSI is is an introductor cience, high-schoon determined in the part of the course on introductor cience, high-schoon determined in the part of the course on introductor cience, high-schoon determined in the part of the p	ance within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professions courses BI-ZS10, BI-ZS20, BI-ZS20 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correctly institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into exceeds the academic year's dead-line. Bachelor internship abroad for 20 credits Bachelor internship abroad for 20 credits once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reservent for the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content in the professional content in the professional content in the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional conte	earch institution all content and earpond to 4 week two subjects if the spond to 4 week two subjects i	Before the extent of the exten
Each student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship the Dear ernship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship. Auxiliary enployment with a feach student can deternship auxiliary enployment with a feach student can detern and enternship auxiliary enployment with a feach student as malware are specially at the dear as a view of the student conductor of the student conductor of the student can detern and the student can determ and the student	once within his / her bachelor's study programme have a foreign internship at a foreign university or other foreign scientific and/or reserved to the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professions or programme have a foreign institution. The maximum number of credits a student can earn for one internship in 1S KOS. Every 10 credits corresponded with the profession of the profession of the profession of the profession of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The student must provide evidence of the professional content. The maximum number of credits a student can earn for one internship in 1S KOS. Every 10 credits corresponding institution. The maximum number of credits a student can earn for one internship in 30 credits. This amount can be divided into exceeds the academic year's dead-line. **Bachelor internship abroad for 30 credits** Bachelor internship abroad for 30 credits Bachelor internship in 1S KOS. Every 10 credits corresponses BI-Z510, BI-Z520, BI-Z530 are used used for the evidence and evaluation of the internship in 1S KOS. Every 10 credits corresponses BI-Z510, BI-Z520, BI-Z530 are used used for the evidence and evaluation of the internship in 1S KOS. Every 10 credits corresponses BI-Z510, BI-Z520, BI-Z530 are used used for the evidence and evaluation of the internship in 1S KOS. Every 10 credi	parch institution al content and espond to 4 week two subjects if the content and espond to 4 week two subjects if the content and espond to 4 week two subjects if the content and espond to 4 week two subjects if the content and espond to 4 week two subjects if the content and respond to 4 week	Before the extent of the sextent of the extent of the extent of the sextent of the extent of the

BIE-DIF	Differential equations	Z,ZK	5
•	es a foundational overview of differential equations, starting with basic motivation and examples of ODEs and progressing to essential so		•
	theorems on existence and uniqueness establish when solutions can be guaranteed. Linear and system-based ODEs are covered wit rsis, followed by examples of non-linear models such as predator-prey and epidemiological models to showcase real-world application		
	equations (PDEs) extends these concepts to multi-variable contexts. The course will also cover numerical methods for solving ODEs		
	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 o	or exceeding
	the B2 level of the Common European Framework of Reference for Languages.	_	
BIE-IMA2	Introduction to Mathematics 2	Z	2
Students refresh a	nd extend knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are a examples.	ible to apply them	in particular
BIE-SEG	Systems Engineering	Z	0
	tory class on systems engineering for bachelor students in computer science. The goal of the class is to introduce basic principles of c	_	
to understand prod	cessor and memory virtualization. Seeing and actually understanding virtualization is the overarching theme of the class. After taking	the class, students	are able to
understand the	difference between processes and threads as well as emulation and virtualization, what virtual memory is and how it works, what cor	ncurrency is, as op	posed to
DIE ZUM	parallelism, and how processes and threads synchronize efficiently to overcome concurrency for communication.	7.71/	
BIE-ZUM	Artificial Intelligence Fundamentals	Z,ZK	4
	luced to the fundamental problems in the Artificial Intelligence, and the basic methods for their solving. It focuses mainly on the classic: ti-agent systems, game theory, planning, and machine learning. Modern soft-computing methods, including the evolutionary algorithm		
.,	be presented as well.		
FI-TOP	Academic writing	Z	2
-	portant and required part of research activity. It is not only about obtaining research results but also about applying them in the form of	-	- 1
•	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		
	ticle, what parts such an article should have, and how the peer review process works. Students will also try their hand at presenting an 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		١ ١
eise's article. The	on the availability of enrolled students.	ates will be determ	illed based
NI-AFP	Applied Functional Programming	KZ	5
	sented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional p	rogramming langu	ages are on
the rise nowadays	s and the functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master	ing this paradigm I	becomes a
	necessary competence of a software engineer: the theory and especially the practice.		
NI-DDM	Distributed Data Mining	KZ	4
	n state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hands o amework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementations a	-	-
р	approaches to parallelize other algorithms. The course is prezented in czech language.		
NI-DSP	Database Systems in Practes	Z,ZK	4
	This course is presented in Czech.		
NI-DZO	Digital Image Processing	Z,ZK	4
=	ents a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical algoes and interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is also		
•	e an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is all processing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR		
	abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray conv	•	- 1
interactive as-ri	gid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, ac	dding depth, alpha	matting.
NI-IAM	Internet and Multimedia	Z,ZK	4
	se is focused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes acq	_	
-	signals (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practical unissions. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the efficiency.		
	ency of AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recording the		
	for audience.		
NI-LSM	Statistical Modelling Lab	KZ	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		
available informati	on and its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, an 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	=	properties.
NI-MOP	Modern Object-Oriented Programming in Pharo	KZ	4
	pgramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where		
is used to build con	pplex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills	of design and imp	lementation
	in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development n		
	ing object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work orms of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involven		
NI-MPL	Managerial Psychology	ZK	2
NI-MSI	Mathematical Structures in Computer Science	Z,ZK	4
	emantics of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Scot		
	Introduction to category theory.		
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	•	
	iability of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver developmen ourse provides knowledge of Linux operating system architecture, principles of development of various types drivers, including practic		ents. The
NI-PDD	urse provides knowledge of Linux operating system architecture, principles of development of various types drivers, including practice Data Preprocessing	Z,ZK	5
	Data Preprocessing repare raw data for further processing and analysis. They learn what algorithms can be used to extract information from various data s	· '	
	and learn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction of characteris		-
	pages.		

NI-PSD	Public Services Design	KZ	4
_	roduce students to specifics of UX, Service design and development for public sector. We will look into the design and development p	rocess from the pe	rspective of
	and designesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration		•
	Course is aimed at students-designers as well as clients.		
NI-PSL	Programming in Scala	Z,ZK	4
The course introd	uces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language featur	es - e.g.pattern ma	atching and
advance standard	library. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks and	l libraries e.g. Play,	Cassandra,
	Scalaz, etc.		
NI-REV	Reverse Engineering	Z,ZK	5
Students will get a	cquainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens before	ore and after the n	nain function
is called. Student	s will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is dedicated	ated to reverse en	gineering of
• •	itten in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be do		-
debuggers and d	ebugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer	malware scene. T	he focus of
	the course is on the seminars, where students will solve practically oriented tasks from the real world.	T	T
NI-SYP	Parsing and Compilers	Z,ZK	5
The module builds	upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of various translation theories is sufficiently a sufficient to the contract of the contract translation theories.	arious variants and	applications
	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 pre		
the intuitive path s	ensitization and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with bu	ilt-in-self-test equi	pment. They
	will be able to compute, analyze, and control the reliability and availability of the designed circuits.		ı
NI-VCC	Virtualization and Cloud Computing	Z,ZK	5
•	in knowledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and	•	
•	irtualization principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficie		•
	arameters of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effecti	• • • • • • • • • • • • • • • • • • • •	•
management of co	mplex computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skills in	n the use of moder	n integration
	and development tools (Continuous integration and development).		
NI-VYC	Computability	Z,ZK	4
	Classical theory of recursive functions and effective computability.	ı	1
TV1	Physical Education	Z	0
TV2	Physical Education	Z	0
TV2K1	Physical Education 2	Z	1
TVK1	Physical Education	Z	1
TVKLV	Physical Education Course	Z	0

Physical Education Course

Physical education

Physical education

Z

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-05-19, time 00:15.

TVKZV

TVV

TVV0