Study plan

Name of study plan: Master specialization Computer Science, in Czech, 2018-2019

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: Follow-up master full-time

Required credits: 97

Elective courses credits: 23 Sum of credits in the plan: 120

Note on the plan: Garant: prof. Ing. Jan Holub, PhD., email: jan.holub@fit.cvut.cz

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 62

The role of the block: PP

Code of the group: NI-PP.2018

Name of the group: Compulsory Courses of Master Study Program, Version 2018, in Czech

Requirement credits in the group: In this group you have to gain 62 credits

Requirement courses in the group: In this group you have to complete 6 courses

Credits in the group: 62 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
MI-KOP	Combinatorial optimization Jan Schmidt	Z,ZK	5	2P+2C	Z	PP
NI-DIP	Diploma Project Zden k Muziká Zden k Muziká Zden k Muziká (Gar.)	Z	30		L,Z	PP
MI-MPR	Master Project Zden k Muziká	Z	7		Z,L	PP
MI-MPI	Mathematics for Informatics Št pán Starosta	Z,ZK	7	3P+2C	Z	PP
MI-PDP.16	Parallel and Distributed Programming	Z,ZK	5	2P+2C	L	PP
MI-VSM	Selected statistical methods	Z,ZK	8	4P+2C	L	PP

Characteristics of the courses of this group of Study Plan: Code=NI-PP.2018 Name=Compulsory Courses of Master Study Program, Version 2018, in Czech

MI-KOP	Combinatorial optimization	Z,ZK	5			
The students will gain knowledge and understanding necessary deployment of combinatorial heuristics at a professional level. They will be able not only to select and implement but						
also to apply and eval	uate heuristics for practical problems.					
NI-DIP	Diploma Project	Z	30			
MI-MPR	Master Project	Z	7			

MI-MPR | Master Project | Z | 7 |
1. At the beginning of the semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide on partial tasks that should be carried out during the semester. If the requirements they agreed upon are met, the supervisor awards the student an assessment for the course MI-MPR at the end of the semester. 2. External Master these (MT) supervisor fills his/her assessment into the paper "Form to award assessment by an external Final theses (FT) supervisor" (for the courses BIE-BAP, MIE-MPR, MIE-DIP). Students, then, ensure that the assessment is registered into the information system (IS) by asking their internal FT opponent to award the assessment to the IS based on the confirmation of the external MT supervisor. In the case the FT opponent is external as well, the assessment will be registered to the IS by the head of the department responsible for the topic of the MT. 3. If the FT topic that the student has reserved is rather general, the immediate tasks the supervisor assigns to the student for the upcoming semester should aim at fine-tuning the FT topic so that the FTT will be complete and approvable at the end of the semester.

MLMPI	Mathematics for Informatics	7 7K	7

The course comprises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analysis, smooth optimization and multi-variate integration. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last topic includes selected numerical algorithm and their stability analysis. The topics are completed with demonstration of applications in computer science. The course focuses on clear presentation and argumentation.

MI-PDP.16	Parallel and Distributed Programming	Z,ZK	5

Due to the development of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parallel and distributed applications are becoming ubiquitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnection networks, and languages and environments for parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of efficient and scalable parallel algorithms and methods of performance evaluation of their implementations.

MI-VSM Selected statistical methods

| Z,ZK | 8

Summary of probability theory; Multivariate normal distribution; Entropy and its application to coding; Statistical tests: T-tests, goodness of fit tests, independence test; Random processes - stacionarity; Markov chains and limiting properties; Queuing theory

Name of the block: Povinné p edm ty specializace

Minimal number of credits of the block: 35

The role of the block: PS

Code of the group: NI-PS-TI.2018

Name of the group: Compulsory Courses of Master Specialization Computer Science, Presented in Czech,

Version 2018

Requirement credits in the group: In this group you have to gain 35 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 35 Note on the group:

Note on the gre	oup.					
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
NI-ADM	Data Mining Algorithms Rodrigo Augusto Da Silva Alves, Pavel Kordík, Daniel Vašata Daniel Vašata Pavel Kordík (Gar.)	Z,ZK	5	2P+1C	L	PS
MI-EVY.16	Efficient Text Pattern Matching	Z,ZK	5	2P+1C	Z	PS
MI-GAK	Graph theory and combinatorics Št pán Starosta	Z,ZK	5	2P+2C	L	PS
MI-KOD.16	Data Compression	Z,ZK	5	2P+1C	L	PS
NI-MVI	Computational Intelligence Methods Pavel Kordík Pavel Kordík Pavel Kordík (Gar.)	Z,ZK	5	2P+1C	Z	PS
MI-NON.16	Nonlinear Continuous Optimization and Numerical Methods	Z,ZK	5	2P+1C	Z	PS
NI-SYP	Parsing and Compilers Jan Janoušek Jan Janoušek (Gar.)	Z,ZK	5	2P+1C	Z	PS

Characteristics of the courses of this group of Study Plan: Code=NI-PS-TI.2018 Name=Compulsory Courses of Master Specialization Computer Science, Presented in Czech, Version 2018

NI-ADM	Data Mining Algorithms	Z,ZK	5
The course focuses on	algorithms used in the fields of machine learning and data mining. However, this is not an introductory course, and the stude	nts should know i	machine learning
basics The emphasis is	a put on advanced algorithms (a.g., gradient boosting) and non book kinds of machine lagraing tasks (a.g., recommendation	avatama) and ma	dolo (o a kornol

methods).

MI-EVY.16 Efficient Text Pattern Matching Z,ZK 5

Students get knowledge of efficient algorithms for text pattern matching. They learn to use so called succinct data structures that are efficient in both access time and memory complexity. They will be able to use the knowledge in design of applications that utilize pattern matching.

MI-GAK Graph theory and combinatorics Z,ZK 5

The goal of the class is to introduce the most important topics in graph theory, combinatorics, combinatorial structures, discrete models and algorithms. The emphasis will be not only on undestanding the basic principles but also on applications in problem solving and algorithm design. The topics include: generating functions, selected topics from graph and hypergraph coloring, Ramsey theory, introduction to probabilistic method, properties of various special classes of graphs and combinatorial structures. The theory will be also applied in the fields

of combinatorics on words, formal languages and bioinformatics.

MI-KOD.16 Data Compression Z,ZK 5

Students are introduced to the basic principles of data compression. They will learn the necessary theoretical background and get an overview of data compression methods being used in practice. The overview covers principles of integer coding and of statistical, dictionary, and context data compression methods. In addition, students learn the fundamentals of least data compression methods used in image, guide, and video compression.

lossy data compression methods used in image, audio, and video compression.

NI-MVI Computational Intelligence Methods Z,ZK 5

Students will understand methods and techniques of computational intelligence that are mostly nature-inspired, parallel by nature, and applicable to many problems. They will learn how these methods work and how to apply them to problems related to data mining, control, intelligen games, optimizations, etc.

MI-NON.16 Nonlinear Continuous Optimization and Numerical Methods Z,ZK 5

Students will be introduced to nonlinear continuous optimization, principles of the most popular methods of optimization and applications of such methods to real-world problems. They will also learn the finite element method and the finite difference method used for solving ordinary and partial differential equations in engineering. They will learn to solve systems of linear algebraic equations that arise from discretization of the continuous problems by direct and iterative algorithms. They will also learn to implement these algorithms sequentially as well as in parallel.

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 of various variants and applications

The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of various variants and applications of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.

Name of the block: Elective courses
Minimal number of credits of the block: 0

The role of the block: V

Code of the group: NI-V.2018

Name of the group: Purely Elective Master Courses, Version 2018

Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0

Note on the group:

In addition to the courses listed here, you can enroll as an elective any course that is offered within your study program and form of study that you did not enroll as a compulsory subject in the program/branch/specialization or a compulsory elective course. Courses of this group that a student has completed in the bachelor study at CTU cannot be re-completed.

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
MI-IKM	Internet and Classification Methods Martin Hole a	Z,ZK	4	1P+1C	L	V
MI-AFP	Applied Functional Programming Robert Pergl	KZ	5	2P+1C	L	V
MI-APH	Architecture of computer games Adam Vesecký	Z,ZK	4	2P+1C	Z	V
MI-BML	Bayesian Methods for Machine Learning Ond ej Tichý	KZ	5	2P+1C	L	V
MI-BPS	Wireless Computer Networks Alexandru Moucha	Z,ZK	4	2P+1C	L	V
MI-DSP	Database Systems in Practes	Z,ZK	4	2P+1C	L	V
NI-DPH	Game Design Adam Vesecký Adam Vesecký (Gar.)	Z,ZK	5	2P+1C	L	V
NI-PSD	Public Services Design David Pešek, Ond ej Brém David Pešek David Pešek (Gar.)	KZ	4	1P+2C		V
MI-DZO	Digital Image Processing	Z,ZK	4	2P+1C	L	V
MI-DDM	Distributed Data Mining	KZ	4	3C	L	V
MI-PAM	Efficient Preprocessing and Parameterized Algorithms	Z,ZK	4	2P+1C	L	V
MI-GLR	Games and reinforcement learning	Z,ZK	4	2P+2C	L	V
NI-GNN	Graph Neural Networks Miroslav epek Miroslav epek (Gar.)	Z,ZK	4	1P+1C	L	V
NI-GRI	Grid Computing André Sopczak, Petr Fiedler André Sopczak (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-HCM	Mind Hacking Marcel Ji ina, Josef Holý Marcel Ji ina Marcel Ji ina (Gar.)	ZK	5	2P+1C	Z	V
MI-HMI2	History of Mathematics and Informatics	ZK	3	2P+1C	Z	V
MI-IBE	Information Security	ZK	2	2P	Z	V
MI-IVS	Intelligent embedded systems Miroslav Skrbek	KZ	4	1P+3C	L	V
NI-IAM	Internet and Multimedia	Z,ZK	4	2P+1C	L	V
MI-IOT	Internet of Things	Z,ZK	4	2P+1C	L	V
MI-ATH	Combinatorial Theories of Games	Z,ZK	4	2P+2C	L	V
NI-FMT	Finite model theory Tomáš Jakl Tomáš Jakl (Gar.)	Z,ZK	4	2P+1C	L	V
NI-CCC	Creative Coding and Computational Art Josef Kortán, Radek Richtr Radek Richtr Radek Richtr (Gar.)	KZ	4	1P+2C	Z,L	V
MI-KYB.16	Cybernality	ZK	5	2P	Z	V
NI-LSM2	Statistical Modelling Lab Kamil Dedecius Kamil Dedecius Kamil Dedecius (Gar.)	KZ	5	3C	Z,L	V
NI-LSM	Statistical Modelling Lab Kamil Dedecius Kamil Dedecius Kamil Dedecius (Gar.)	KZ	5	3C	L	V
MI-LOM.16	Linear Optimization and Methods	Z,ZK	5	2P+1C	Z	V
MI-MPX	Management practice David Buchtela	Z	4	5XD	Z,L	V
FI-MPL	Managerial Psychology	ZK	2	2+0	Z,L	V
MI-MSI	Mathematical Structures in Computer Science	Z,ZK	4	2P+1C	L	V
MI-MZI	Mathematics for data science Daniel Vašata	Z,ZK	4	2P+1C	L	V
NI-MOP	Modern Object-Oriented Programming in Pharo Marek Skotnica, Jan Blizni enko Robert Pergl Robert Pergl (Gar.)	KZ	4	3C	Z	V
MI-MPC	Modern programming in C ++ Daniel Langr	Z,ZK	5	2P+1C	Z	V
MI-MAI	Multimedia and Internet	Z,ZK	3	2P+1C	L	V

MI-OLI	Linux Drivers Miroslav Skrbek	Z,ZK	4	2P+2C	L	V
NIE-PML	Personalized Machine Learning Rodrigo Augusto Da Silva Alves Karel Klouda Rodrigo Augusto Da Silva Alves (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-ARI	Computer arithmetic Alois Pluhá ek	Z,ZK	4	2P+1C	Z,L	V
NI-PG1	Computer Grafics 1 Radek Richtr Radek Richtr (Gar.)	ZK	4	2P+1C	L	V
MI-PVR	Advanced Virtual Reality	KZ	4	2P+1C	Z	V
NI-AML	Advanced machine learning Rodrigo Augusto Da Silva Alves, Miroslav epek, Petr Šimánek, Vojt ch Rybá, Zden k Buk Miroslav epek Miroslav epek (Gar.)	Z,ZK	5	2P + 1C	L	V
MI-IOS	Advanced techniques in iOS applications	KZ	4	2P+2C	L	V
MI-PVS	Advanced embedded systems Miroslav Skrbek	Z,ZK	4	2P+2C	Z	V
MI-DNP	Advanced .NET	Z,ZK	4	2P+1C	Z	V
MI-PYT	Advanced Python	KZ	4	3C	Z	V
NIE-PDL	Practical Deep Learning Martin Barus, Yauhen Babakhin Karel Klouda Martin Barus (Gar.)	KZ	5	2P+1C	Z	V
MI-PRC	Programming in CUDA Ivan Sime ek	Z,ZK	4	2P+1C	L	V
MI-PSL	Programming in Scala	Z,ZK	4	2P+1C	L	V
MI-RUB	Programming in Ruby	KZ	4	3C	Z	V
MI-PCM.16	Project And Change Management	KZ	3	1P+2C	Z,L	V
MI-ROZ.16	Petra Pavlí ková Pattern Recognition	Z,ZK	5	2P+1C	Z	V
MI-RRI	Risk Management in Informatics	ZK	3	2P	L	V
MI-SCE2	Computer Engineering Seminar Master II	Z	4	2C	L,Z	V
MI-SZ1	Knowledge Engineering Seminar Master I Karel Klouda	Z	4	2C	L,Z	V
PI-SCN	Seminars on Digital Design Petr Fišer Petr Fišer (Gar.)	ZK	4	2P+1C	Z,L	V
BI-SOJ	Machine Oriented Languages	Z,ZK	4	2P+2C	L	V
NI-MLP	Machine Learning in Practice Jan Hu in Daniel Vašata Jan Hu in (Gar.)	Z,ZK	5	2P+1C	Z	V
BI-SVZ	Machine vision and image processing Marcel Ji ina, Lukáš Brchl, Jakub Novák Marcel Ji ina Marcel Ji ina (Gar.)	Z,ZK	5	2P+2C	L,Z	V
MI-SEP	World Economy and Business	Z,ZK	4	2P+1C	Z	V
MI-TS1	Theoretical Seminar Master I		4	2C	Z	V
MI-TS2	Theoretical Seminar Master II	Z	4	2C	L	V
MI-TS3	Theoretical Seminar Master III	Z	4	2C	Z	V
MI-TS4	Theoretical Seminar Master IV	Z	4	2C	L	V
MI-TNN	Theory of Neural Networks Daniel Vašata	Z,ZK	4	1P+1C	L	V
NI-TNN	Theory of Neural Networks Martin Hole a Martin Hole a Martin Hole a (Gar.)	Z,ZK	5	2P+1C	L	V
FI-KSA	Cultural and Social Anthropology	ZK	2	2P	L,Z	V
FI-ULI	Introduction to Linguistics for Computer	ZK	2	2P	L	V
MI-VEM	Scientific thinking	KZ	2	1P+1C	L	V
MI-MCS	Multicore Systems	KZ	4	1P+2C	Z	V
BI-VMM	Selected Mathematical Methods Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	4	2P+2C	L	V
MI-VYC	Computability	Z,ZK	4	2P+2C	L	V
NI-VPR	Research Project Št pán Starosta Št pán Starosta Št pán Starosta (Gar.)	Z	5		Z,L	V
MI-ZS10	Master internship abroad for 10 credits Zden k Muziká	Z	10		Z,L	V
MI-ZS20	Master internship abroad for 20 credits Zden k Muziká	Z	20		Z,L	V
	Edon n mazina		1			

Characteristics of the courses of this group of Study Plan: Code=NI-V.2018 Name=Purely Elective Master Courses, Version 2018

MI-IKM	Internet and Classification Methods	Z,ZK	4			
	ents get acquainted with classification methods used in four important internet, or generally network applications: in spam filte	_				
•	stems and in intrusion detection systems. However, they will learn more than only how classification is performed when solving and interest on systems and in intrusion detection systems.	•				
On the background of these applications, they get an overview of the fundamentals of classification methods. The course is taught in a 2-weeks cycle with 2-hour lectures and 2-hour exercises. During the exercises, the students on the one hand implement simple examples to topics from the lectures, on the other hand consult their semester tasks.						
MI-AFP	Applied Functional Programming	KZ	5			
	ן Applied 1 directional 1 rogical mining d in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional	· .	-			
· · · · · · · · · · · · · · · · · · ·	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.					
MI-APH	Architecture of computer games	Z,ZK	4			
-	ic understanding of the various issues in the field of computer game development, from both the technical and creative point	-				
•	chitecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of path	hfinding, networkir	ng, and scripting			
and apply them in pract		1/7				
MI-BML	Bayesian Methods for Machine Learning	KZ	5 n of appropriate			
=	on practical use of basic Bayesian modeling methods in the dynamically evolving machine learning theory. In particular, it studi iption of real phenomena, as well as their subsequent use, e.g., for forecasting of future evolution or learning about the hidde					
	etc.). The emphasis is put on understanding of explained principles and methods and their practical adoption. For this purpose					
and applications will be	presented to students, for instance, 2D/3D object tracking, radiation source term estimation, or separation in medical imaging	g. The students wi	Il try to solve			
some of them.						
MI-BPS	Wireless Computer Networks	Z,ZK	4			
	at the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in					
	, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get know	wledge of security	mechanisms			
	nd get skills of configuration of wireless network elements and simulation of wireless networks using suitable tools.	7.71				
MI-DSP	Database Systems in Practes	Z,ZK	4			
This course is presente		Z.ZK	5			
NI-DPH	Game Design ts the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on gan	· ' I	-			
· ·	by ledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics	_				
•	students will get an overview of game development from the designer's perspective, from theoretical concepts to practical im					
projects.						
NI-PSD	Public Services Design	KZ	4			
The course will introduc	e students to specifics of UX, Service design and development for public sector. We will look into the design and development	nt process from the	e perspective of			
	signesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration	on with client repr	esentatives.			
	lents-designers as well as clients.					
MI-DZO	Digital Image Processing	Z,ZK	4			
•	comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical a interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is	-	-			
•	ring. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDF					
	raction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray c	•	ŭ			
interactive as-rigid-as-p	ossible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, ac	dding depth, alpha	matting.			
MI-DDM	Distributed Data Mining	KZ	4			
	e-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hand					
	ork Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementation	s and will be capa	ble to propose			
	te other algorithms. The course is prezented in czech language.	7 714				
MI-PAM	Efficient Preprocessing and Parameterized Algorithms	Z,ZK	4			
	ation problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often nece will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often o	=				
, ,	s from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity expo					
. , .	input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomia	,	, ·			
which is not possible in	the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution	ion method. We wi	Il present a			
plethora of parameteriz	ed algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (presumably) does	not exist. We			
	e relations to other approaches to hard problems such as moderately exponential algorithms or approximation schemes.					
MI-GLR	Games and reinforcement learning	Z,ZK	4			
	ent learning is very hot recently, because of advances in deep learning, recurrent neural networks and general artificial intellig	gence. This course	is intended to			
	al and practical background so you can participate in related research activities. Presented in English.	7 71/	4			
NI-GNN	Graph Neural Networks Students to advanced artificial intelligence techniques for working with graphs. Lectures will focus on the latest graph neural n	Z,ZK	4			
	is, edges and entire graphs. The techniques discussed cover various types of graphs, including time-varying graphs. The last		-			
•	sterpretability of graph neural networks. In the exercises, students will try out selected techniques and problems.					
NI-GRI	Grid Computing	Z,ZK	5			
Grid computing and gai	n knowledge about the world-wide network and computing infrastructure.					
NI-HCM	Mind Hacking	ZK	5			
Cognitive security is an	emerging discipline that is closely related to cyber security. While the domain of cyber security is the protection of networks,	information syster	ns and assets,			
•	security is the protection of the human mind from intentional and unintentional digital manipulation. The topic of cognitive sec	, , ,				
	on warfare, increasing digital dependence and the development of artificial intelligence, where these phenomena from the Inter-	net environment h	ave real societal			
	ion of social cohesion, threats to democracy or war.	71/				
MI-HMI2 Selected topics (Infinite	History of Mathematics and Informatics simal calculus, probability, number theory, general algebra, different examples of algorithms, transformations, recursive functi	ZK	3 etc.) note on			
	simal calculus, probability, number theory, general algebra, different examples of algorithms, transformations, recursive functions of some mathematical methods in informatics and its development.	iona, enpuio curves	, Gio., Hole UII			
MI-IBE	Information Security	ZK	2			
	ion and IS/ICT security management systems (ISMS), methods for information access control, and basic norms and internat					
	management of internal and external security threats, for IS/IT security audits, and for application security testing (e.g., pen		2 22 22 7			
		-				

MI-IVS	Intelligent embedded systems	KZ	4				
-	Intelligent embedded systems course for master's degree is focused on high-level technology embedded systems integrating artificial intelligence. The course is an advance version						
•	ded system fundamentals course for the bachelor degree. The aim of the course is to teach students humanoid robot progra provide basis of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, stude	•					
combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web technologies							
NI-IAM	Internet and Multimedia	Z,ZK	4				
The NI-IAM course is fo	icused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes a	1 ' 1	gnals (input),				
-	als (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practic						
	ns. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the						
for audience.	of AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recordin	ig the scene up to	the presentation				
MI-IOT	Internet of Things	Z,ZK	4				
-	on the area of hardware and software technologies for the strongly growing computer support of various devices. Its goal is f	1 ' 1					
development elements	(Raspberry Pi, Arduino Due) and with the language for efficient application development and modification (GNU Forth).						
MI-ATH	Combinatorial Theories of Games	Z,ZK	4				
This course is presente							
NI-FMT	Finite model theory	Z,ZK	4				
	s to introduce students to the basics of finite model theory. The original motivation is the questions expressibility and verifiabilion in the 1970s, the course has evolved rapidly and touched on many other areas of theoretical computer science, such as						
	Problem (CSP), the theory of algorithmic meta-theorems and combinatorics.	s descriptive comp	lexity trieory, trie				
NI-CCC	Creative Coding and Computational Art	KZ	4				
	cal tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows	the basic graphics	s courses (MGA,				
	students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technology	•	٠ ا				
•	he aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture a	nd Metropolitan Pl	anning) and IIM				
(Institute of Intermedia		71/					
MI-KYB.16	Cybernality d with the fundamentals of legislation and international activities in the area of fighting cybercrime. Students will understand	ZK the classification of	5 of attacks and				
= :	tems for computer surveillance and traffic monitoring in the cyberspace. Students will also familiarize themselves with hacker						
•	operation of the state agencies and subjects dealing with defence of the cyberspace (especially CSIRT and CERT teams).						
NI-LSM2	Statistical Modelling Lab	KZ	5				
The topic of LSM2 is ac	vanced multiple target tracking (MTT). This domain covers simultaneous tracking of multiple targets using radar under the pre	esence of clutter, c	or video tracking.				
	he-art filters, in particular the PHD (Probability Hypothesis Density) and PMBM (Poisson Multi-Bernoulli) filters.						
NI-LSM	Statistical Modelling Lab	KZ	5				
	on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is ad its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms,	-					
	t is on the border of own research and may result in the topic of final work (diploma or bachelor thesis).	, and analyses of t	neli properties.				
MI-LOM.16							
IVII-LOIVI. 10	Linear Optimization and Methods	l Z.ZK l	5				
=	Linear Optimization and Methods ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line	1 ' 1	-				
Students learn the appl are able to work with or	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of interesting interesting and are familiar with languages used in programming of that software. They get skills in formalization of of the contraction of the contraction of the contraction in the contraction of the contraction o	ear and integer pro	ogramming. They ems in computer				
Students learn the appl are able to work with op science (such as sched	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line otimization software and are familiar with languages used in programming of that software. They get skills in formalization of culting of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, tra	ear and integer pro optimization proble velling salesman p	ogramming. They ems in computer problems, etc.),				
Students learn the appl are able to work with op- science (such as sched issues from economics	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of interesting interesting and are familiar with languages used in programming of that software. They get skills in formalization of of the contraction of the contraction of the contraction in the contraction of the contraction o	ear and integer pro optimization proble velling salesman p	ogramming. They ems in computer problems, etc.),				
Students learn the appl are able to work with op science (such as schec issues from economics in linear programming.	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line stimization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems.	ear and integer pro optimization proble velling salesman p	gramming. They ems in computer problems, etc.), on in algorithms				
Students learn the appl are able to work with op science (such as sched issues from economics in linear programming. MI-MPX	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line otimization software and are familiar with languages used in programming of that software. They get skills in formalization of culting of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, tra	ar and integer properties are and integer properties are also problems. They get orientation	gramming. They ems in computer problems, etc.), on in algorithms				
Students learn the appl are able to work with op science (such as sched issues from economics in linear programming. MI-MPX The Student can once,	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of industry and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice	ear and integer properties and integer properties and integer properties are also provided and the control of t	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic				
Students learn the appl are able to work with op science (such as sched issues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the resources.	ar and integer properties are and integer properties and integer properties are also as a second properties are assessed well in a second properties are assessed well as a second properties are a second propert	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the				
Students learn the appl are able to work with op science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the member of the top man	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the properties of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement).	ar and integer properties are and integer properties and integer properties are also as a second and are assessed well in a parties of the students.	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a				
Students learn the appl are able to work with opscience (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the member of the top man	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of outling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology	ear and integer properties are and integer properties and integer properties are also as a second of the students of the students are assessed well in elatives of the students are assessed well are also as a second and also assessed well are also as a second are a	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treatment of the top maner of the top maner of the MI-MSI	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violation of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science	ar and integer properties are and integer properties and integer properties are also as a second and are assessed well in a parties of the students.	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treatment of the top management) FI-MPL MI-MSI Mathematical semantic	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violation of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science sof programming languages.	ar and integer proportion problems are and integer proportion problems. They get orientation between the content of the conten	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (trourse guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of the stimization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the volume of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practi	ar and integer proportion problems are also problems. They get orientation are assessed well in a clatives of the students. ZK Z/ZK Z/ZK	gramming. They ems in computer problems, etc.), on in algorithms 4 otical or strategic advance the lent (e.g. as a				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (trourse guarantor. In the member of the top management of the top management) MI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violation of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science sof programming languages.	ar and integer proportion and integer proportion proble velling salesman problem in sa	gramming. They ems in computer problems, etc.), on in algorithms 4 otical or strategic advance the lent (e.g. as a 2 4 4 4 4 es studied topics				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (trourse guarantor. In the member of the top management of the top management) MI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear all	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violation of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice	ar and integer proportion and integer proportion proble velling salesman problem in sa	gramming. They ems in computer problems, etc.), on in algorithms 4 otical or strategic advance the lent (e.g. as a 2 4 4 4 4 es studied topics				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (trourse guarantor. In the member of the top management of the top management) MI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear all	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violation of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice	ar and integer proportion and integer proportion proble velling salesman problem in sa	gramming. They ems in computer problems, etc.), on in algorithms 4 otical or strategic advance the lent (e.g. as a 2 4 4 4 4 es studied topics				
Students learn the appl are able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treatment of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from p NI-MOP Object-oriented program	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violational project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science sof programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printobability theory and statistics. Modern Object-Oriented Programming in Pharo mining is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who	ar and integer proportion and integer proportion and integer proportion and proportion are assessed well in elatives of the student accordance of th	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treourse guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from pint-MOP Object-oriented program is used to build complex	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line of imization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so f programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality print robability theory and statistics. Modern Object-Oriented Programming in Pharo ming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the standard applications.	ar and integer proportion and integer proportion and integer proportion and proportion are assessed well in elatives of the student accordance of th	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4				
Students learn the applare able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treatment of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear as selected notions from pint-MOP Object-oriented program is used to build complex of object systems in more services.	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line bimization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the properties of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so of programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printobability theory and statistics. Modern Object-Oriented Programming in Pharo Inming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the statem pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development	ar and integer proportimization problevelling salesman problem salesman salesman problem salesman salesman problem salesman salesman problem salesman problem salesman salesman salesman problem salesman salesma	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (trourse guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear as selected notions from pinched program is used to build complex of object systems in moaddition to deepening control of several such as selected not only the service of object systems in moaddition to deepening control of several such as selected not only the service of object systems in moaddition to deepening control of several such as selected not only the service of object systems in moaddition to deepening control of several such as selected not only the service of several sev	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line bimization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so f programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printobability theory and statistics. Modern Object-Oriented Programming in Pharo norming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the selected subject programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo	ar and integer proportion and integer proportion and integer proportion and proportion are assessed well in a clatives of the student and a classes and are as skills of design and at needs and areas ork on interesting proportion proportion and areas ork on interesting proportion proportion and interesting proportion proportion and interesting proportion proportion and interesting proportion and i	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4				
Students learn the applare able to work with or science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treatment of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from pinched program is used to build complex of object systems in meaddition to deepening of technologies in terms of the science (such as a specific program is used to build complex of object systems in meaddition to deepening of technologies in terms of the science (such as science).	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line stimization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice Within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the violability of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science To programming languages. Mathematics for data science The are necessary for understanding standard methods and algorithms used in gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printrobability theory and statistics. Modern Object-Oriented Programming in Pharo The ming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the expect of the programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involving the semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involving the semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involong the programming in the possibility of cooperation with practi	ar and integer proportimization problevelling salesman problem statement in the Phamara salesman problem integer pro	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (treatment of the top manner of the top manne	ications of optimization methods in computer science, economics, and industry. They are aware of practical importance of line bimization software and are familiar with languages used in programming of that software. They get skills in formalization of ouling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so f programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printobability theory and statistics. Modern Object-Oriented Programming in Pharo norming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the selected subject programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo	ar and integer proportion and integer proport	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (the course guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from picture. NI-MOP Object-oriented program is used to build complex of object systems in modadition to deepening of technologies in terms of MI-MPC Students learn how to can deficiency in the for	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line stimization software and are familiar with languages used in programming of that software. They get skills in formalization of culing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice Within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the properties of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science To programming languages. Mathematics for data science The are necessary for understanding standard methods and algorithms used in gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printobability theory and statistics. Modern Object-Oriented Programming in Pharo In ming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the expert of the programming in the programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involution of the programming in C ++	ar and integer proportion and integer proport	gramming. They ams in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (the course guarantor. In the member of the top management of MI-MZI In this course, students include mainly: linear all selected notions from policy of the top management of the top ma	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line stimization software and are familiar with languages used in programming of that software. They get skills in formalization of outling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, train and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is selected subject of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used agebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prir robability theory and statistics. Modern Object-Oriented Programming in Pharo mining is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the eldern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development bject programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to we ferement and with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involuded modern programming in C++ see the modern	ar and integer proportion and integer proport	gramming. They ams in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g. as a lent described and lent lent lent lent lent lent lent lent				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (the course guarantor. In the member of the top management (the science) with the science of the top management (the science) with the science of the top management (the science) with the science of the top management (the science) with the science of the top management (the science) with the science of the top management (the science) with the science of the sci	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line intrinzation software and are familiar with languages used in programming of that software. They get skills in formalization of valing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the properties of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so for programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality princobability theory and statistics. Modern Object-Oriented Programming in Pharo mining is currently one of the most widespread paradigms of software creation, especially enterprise information systems, whomodern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the edgen pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development before programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to we semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct invol Modern programming in C ++ see the modern features of contemporary versions of the C++ programming language for software development. The course for of will menal and Internet in	ar and integer proportion and integer proport	gramming. They ams in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (the course guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from picture. NI-MOP Object-oriented program is used to build complex of object systems in moderation addition to deepening of technologies in terms of MI-MPC Students learn how to use and efficiency in the for MI-MAI The course will cover propaplication areas of net	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line bitmization software and are familiar with languages used in programming of that software. They get skills in formalization of valuing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the position of project manager, middle or top manager). The selected subject of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics. Modern Object-Oriented Programming in Pharo numing is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the expective programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to we feemesteral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involuded reportance of contemporary versions of the C++ programming language for software development. The course form of writing maintainable and portable source code and creating correc	ar and integer proportion and integer proport	gramming. They ams in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from picture. NI-MOP Object-oriented program is used to build complex of object systems in mode addition to deepening of technologies in terms of MI-MPC Students learn how to use and efficiency in the for MI-MAI The course will cover prapplication areas of net and distributed collaboration.	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line intrinzation software and are familiar with languages used in programming of that software. They get skills in formalization of rulling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, tra, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prirobability	ar and integer proportimization problevelling salesman problem studies of the studies of the studies of the studies and areas problem salesman problem salesm	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear at selected notions from picture. NI-MOP Object-oriented program is used to build complex of object systems in moded addition to deepening of technologies in terms of MI-MPC Students learn how to use and efficiency in the for MI-MAI The course will cover propaplication areas of net and distributed collabor MI-OLI	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line bitmization software and are familiar with languages used in programming of that software. They get skills in formalization of valuing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trained modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the position of project manager, middle or top manager). The selected subject of practice and professional filling is selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics. Modern Object-Oriented Programming in Pharo numing is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the expective programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to we feemesteral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involuded reportance of contemporary versions of the C++ programming language for software development. The course form of writing maintainable and portable source code and creating correc	ar and integer proportion and integer proport	gramming. They ams in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear all selected notions from picture. NI-MOP Object-oriented program is used to build complex of object systems in mode addition to deepening of technologies in terms of MI-MPC Students learn how to use and efficiency in the for MI-MAI The course will cover propagation of the course will be course will be course will be counted to the course will be course willess will be course will be course will be course will be course w	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line intrinzation software and are familiar with languages used in programming of that software. They get skills in formalization of valing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, tra and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is eselected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality printobability theory and statistics. Modern Object-Oriented Programming in Pharo mining is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who medical programming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who medical programming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who medical programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to we semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct invol Modern programmi	ar and integer proportion and integer proportion. Value Val	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				
Students learn the applare able to work with of science (such as schedissues from economics in linear programming. MI-MPX The Student can once, level of management (to course guarantor. In the member of the top man FI-MPL MI-MSI Mathematical semantic MI-MZI In this course, students include mainly: linear all selected notions from picture. NI-MOP Object-oriented program is used to build complex of object systems in mode addition to deepening of technologies in terms of MI-MPC Students learn how to use and efficiency in the for MI-MAI The course will cover program and distributed collabor MI-OLI The Linux operating system contents and distributed collabor MI-OLI The Linux operating system coverage the variability.	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line bitmization software and are familiar with languages used in programming of that software. They get skills in formalization of valing of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, tra, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. Management practice within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the position of project manager, middle or top manager). The selected subject of practice and professional filling is a selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the reagement). Managerial Psychology Mathematical Structures in Computer Science so programming languages. Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prir robability theory and statistics. Modern Object-Oriented Programming in Pharo naming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the eigent programming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who modern applications in this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the eigent programming is currently one of the most widespread paradigms of software creation, especially enterprise information, their development biject programming skills, which	ar and integer proportion and integer proportion. Value Val	gramming. They ems in computer problems, etc.), on in algorithms 4 ctical or strategic advance the lent (e.g. as a lent (e.g.				

NIE-PML	Personalized Machine Learning	Z,ZK	5				
Personalized machine learning (PML) is a sub-field of machine learning that aims to create models and predictions based on the unique characteristics and behaviors of individual							
	ommonly used in applications such as recommender systems, which recommend items to users based on their personal inte						
-	fields, including education, medicine, and chemical engineering. In this course, we will explore the latest PML methods from the ly, we will focus on cutting-edge models that are of interest to both the research and commercial communities.	eretical, algorithm	nic, and practical				
MI-ARI	Computer arithmetic	Z,ZK	4				
	bus data representations used in digital devices and will be able to design arithmetic operations implementation units.	2,21	7				
NI-PG1	Computer Grafics 1	ZK	4				
_	aphic courses (mainly BI-PGA and BI-PGR) and the knowledge from these courses is deepened by state-of-the-art knowledge	1 1	signed for those				
interested in advanced	computer graphics. Students will gain practical knowledge with realistic texturing and raytracing methods. An integral part of t	he course is the s	tudy of scientific				
	quent implementation. The course will be followed by a course PG2 supplementing the knowledge of PG1 on other areas and	d topics of comput	ter graphics.				
MI-PVR	Advanced Virtual Reality	KZ	4				
	advanced parts of the virtual reality. It is a continuation of the already running graphic objects, especially the creation of 3D mo		-				
-	tents to their application in virtual reality. Lectures will focus on virtual reality technology, its use in various applications and will a (mainly Unity3D). The course is freely connected with the subject VHS (virtual game worlds), students will be able to apply the						
-	the create a complex game for VR.	s knowledge gairle	ed iii tiiis subject				
NI-AML	Advanced machine learning	Z,ZK	5				
	students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field of		-				
	interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the						
MI-IOS	Advanced techniques in iOS applications	KZ	4				
Students will learn the la	atest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all th	e basics from the	beginners class				
BI-IOS.							
MI-PVS	Advanced embedded systems	Z,ZK	4				
	on ARM processors and microcontrollers and their usage in wide range of applications. The course includes a series of advar	•					
systems.	age devices, motor control, system control and industrial communication. The students obtain both theoretical and also practi	cai experiences w	ntri embedded				
MI-DNP	Advanced .NET	Z,ZK	4				
	ן אמעמוזכם זאב ז wledge about advanced desgin of applicatios on a .NET platform.They gain skills of WPF (Windows Presentation Foundatior	1 ' 1					
•	ation) and Entity Framework. They are able to apply these skills on a development and desgin of advanced .NET applications						
MI-PYT	Advanced Python	KZ	4				
The goal of this course	is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyth	ion (BI-PYT) left o	f. The course is				
-	s only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral coursew	ork. The course is	lead by external				
teachers from Red Hat.							
NIE-PDL	Practical Deep Learning	KZ	5				
-	I to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machine I develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields su	_	-				
language processing.	r develop practical skills in building and training deep fiedral fietworks, using Fy forch to solve real-world problems in fields so	cir as computer vi	ision and natural				
MI-PRC	Programming in CUDA	Z,ZK	4				
_	od overview of present parallel architectures in GPUs. Students also get hands-on experience with programming these system	1 1	•				
MI-PSL	Programming in Scala	Z.ZK	4				
The course introduces t	the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language feat	tures - e.g.pattern	matching and				
advance standard librar	y. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks	and libraries e.g. F	Play, Cassandra,				
Scalaz, etc.							
MI-RUB	Programming in Ruby	KZ	4				
This course is presente		1.7					
MI-PCM.16	Project And Change Management	KZ	3				
This course is presente		7.71/					
MI-ROZ.16	Pattern Recognition is to give a systematic account of the major topics in pattern recognition with emphasis on problems and applications of the s	Z,ZK	5 h to pattern				
	ill learn the fundamental concepts and methods of pattern recognition, including probability models, parameter estimation, ar		•				
MI-RRI	Risk Management in Informatics	ZK	3				
	very often considered as one of main objectives to secure targets of information processing. However, to focus on this info se	1	_				
IT systems against virus	ses, malware etc. very often means misunderstanding and underestimating of real threats which are around us and which are	more dangerous t	then viruses and				
	essity to continue with business after disaster is also slightly ignored. International standards which are focused on information						
- ·	d to anticipate necessity of risk management. There is no commonly accepted methodology used for this task. Threats which		sible to see				
	sures to prepare plans for business continuity management even in the case of dramatic political changes, natural disasters e	1	4				
MI-SCE2	Computer Engineering Seminar Master II	Z	4				
· ·	ter Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistanc Lally within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of t						
• • •	ssional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers.	•					
semester.		•					
MI-SZ1	Knowledge Engineering Seminar Master I	Z	4				
	present a research paper from a top institute / research group to your peers. You will learn what is being cooked in top research	arch labs around t	he world.				
= =	rn how to properly present and read scientific papers. The work in the seminar will prepare you to attend (and profit from) top ma	chine learning and	d AI conferences				
	s well as FIT's own Summer Research Program (VyLet).						
PI-SCN	Seminars on Digital Design	ZK	4				
	problems of realization and implementation of digital circuits - both combinational and sequential. Basic means of description ion algorithms are described. Basics of EDA (Electronic Design Automation) systems are given, together with combinatorial processing the second state of the combinatorial processing the second seco	_	-				
BI-SOJ	Machine Oriented Languages	Z,ZK	4				
	rividentifie Otterfied Larrydages will gain an ability to create their own programs in the assembly language of the most common PC platform focusing on optima	1 ' 1	-				
	n of software with hardware. Next, there will be discussed x86 specifics of the majority of OSes from the application point of vie	=					
	used during reverse engineering, optimization, and evaluation of code security.						

NI-MLP	Machine Learning in Practice	Z,ZK	5
	ing methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ents through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practic		
	arn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and und		
BI-SVZ	Machine vision and image processing	Z,ZK	5
	coming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluate	, ,	
introduces students to d	ifferent types of camera systems and a variety of methods for image and video processing. The course is focused on practical	use of camera sys	stems for solving
·	at the graduates may encounter.		
MI-SEP	World Economy and Business	Z,ZK	4
•	d in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students o t does that predominantly by comparing individual countries and key regions of world economy. Students get to know about o		-
	siness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed	_	
· · · · · ·	ve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course	-	
MI-TS1	Theoretical Seminar Master I	Z	4
	ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class		•
•	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is	a work with scier	ntific papers and
· · · · · · · · · · · · · · · · · · ·	e. The capacity is limited by the the potentials of the teachers of the seminar. Theoretical Seminar Master II	Z	4
MI-TS2 Theoretical seminar is in	Theoretical Seminal Master II ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clas		•
	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is		
other scholarly literature	e. The capacity is limited by the the potentials of the teachers of the seminar.		
MI-TS3	Theoretical Seminar Master III	Z	4
	ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class		
= = = = = = = = = = = = = = = = = = = =	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is	a work with scier	ntific papers and
MI-TS4	e. The capacity is limited by the the potentials of the teachers of the seminar. Theoretical Seminar Macter IV	Z	4
	Theoretical Seminar Master IV tended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clas	= !	•
	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is		•
= = = = = = = = = = = = = = = = = = = =	e. The capacity is limited by the the potentials of the teachers of the seminar.		
MI-TNN	Theory of Neural Networks	Z,ZK	4
	neural networks from the point of view of the theory of function approximation and from the point of view of probability theory		
	eural Networks, such as neurons and connections between them, types of neurons from the point of view of signal transmission		
	work training, and the role of time in neural networks. In connection with network topology, we get acquainted with its transfor somatic and synaptic mappings, with their composition into mappings computed by the Network, Finally in connection with tra		
	and to the fact that training is actually a specific optimization task, recalling the most typical objective functions and the most		
employed for neural net	work training. We will see the meaninig of all these concepts in the context of common kinds of forward neural networks. Within	the topic approxin	nation approach
	irst notice the connection of neural networks to expressing functions of many variables using functions of fewer variables (Ko	_	
•	e will see how the universal approximation capacity of neural networks can be mathematically formalized as the sets of mappi		
= :	nt Banach spaces of functions, in particular in the spaces of continuous functions, spaces of functions integrable with respect is derivatives, and Sobolev spaces. Within the topic probabilistic approach, we first get acquainted with training based on exp		•
	h probabilistic assumptions about training data with which those two kinds of neural networks can be employed. We will see he		- 1
of the conditional expec	tancy of network outputs conditioned by its inputs using the expectancy based learning. We recall the strong and the weak la	w of large numbe	rs and get
•	logy of the strong law of large numbers for neural networks and with the assumptions for its validity. Finally, we recall the cent		- '
with its analogy for neur topology of the network.	al networks, with the assumptions for its validity and with the hypothesis tests based on it. We will see how those tests can be	employed to sea	arch for the
NI-TNN	Theory of Neural Networks	Z,ZK	5
	neural networks from the point of view of the theory of function approximation and from the point of view of probability theory		-
	eural Networks, such as neurons and connections between them, types of neurons from the point of view of signal transmission		
synaptic mappings, net	work training, and the role of time in neural networks. In connection with network topology, we get acquainted with its transfor	mation into a can	onical topology,
	somatic and synaptic mappings, with their composition into mappings computed by the Network, Finally in connection with tra-		
	and to the fact that training is actually a specific optimization task, recalling the most typical objective functions and the most work training. We will see the meaninig of all these concepts in the context of common kinds of forward neural networks. Within		
	irst notice the connection of neural networks to expressing functions of many variables using functions of fewer variables (Ko		
	e will see how the universal approximation capacity of neural networks can be mathematically formalized as the sets of mappi	•	
being dense in importar	nt Banach spaces of functions, in particular in the spaces of continuous functions, spaces of functions integrable with respect	to a finite measur	re, spaces of
	is derivatives, and Sobolev spaces. Within the topic probabilistic approach, we first get acquainted with training based on exp		-
· ·	h probabilistic assumptions about training data with which those two kinds of neural networks can be employed. We will see he	•	•
· · · · · · · · · · · · · · · · · · ·	tancy of network outputs conditioned by its inputs using the expectancy based learning. We recall the strong and the weak la logy of the strong law of large numbers for neural networks and with the assumptions for its validity. Finally, we recall the cent	_	-
•	al networks, with the assumptions for its validity and with the hypothesis tests based on it. We will see how those tests can be		- '
topology of the network.			
FI-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 dive	•	
· -	h from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, he n interesting alternative to other humanities, taught at FIT.	aith, history, deat	n, etc) Will be
FI-ULI	Introduction to Linguistics for Computer	ZK	2
This course is presented		۷۱۱	_
MI-VEM	Scientific thinking	KZ	2
	urse is to get acquainted with scientific methods and discovery of order and laws of the universe, including the aspects of hun		
	tural sciences, mathematics, computer science and humanities. Another aim is to introduce rules and requirements of scienti	fic communication	n via research
papers and posters.			

MI-MCS | Multicore Systems | KZ | 4

Students understand architecture of systems based on multicore processors with multiple threads per core, structure and usage of cache hierarchy with shared last level. They learn parallel algorithm classification, parallel programming technics, simulation and monitoring tools for measurement and optimization of parallel algorithms. After this course, students can design MTMD programs (Multiple Threads Multiple Data), measure and analyze latency and throughput of parallel algorithms and optimize them for contemporary multicore systems.

BI-VMM Selected Mathematical Methods

Z,ZK 4

We start reviewing geometric properties of linear spaces with inner product. Next, we introduce and analyze the discrete Fourier transform (DFT) and its fast implementation (FFT). Further we deal with differential calculus of functions involving multiple variables. We present methods for the localization of extreme values of functions. For this purposes, we study normed linear spaces and quadratic forms. In addition, we introduce the least square method. The last part of the course is devoted to optimization and duality. The linear programming and the Simplex method is analyzed in more detail.

	•		
MI-VYC	Computability	Z,ZK	4
Classical theory of recu	rsive functions and effective computability, with applications in provability theory.		
NI-VPR	Research Project	Z	5
Student obtains the cre-	dits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.		·
MI-ZS10	Master internship abroad for 10 credits	Z	10

Each student can once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses MI-ZS10, MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship exceeds the academic year's dead-line.

MI-ZS20 Master internship abroad for 20 credits

20

Each student can once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses MI-ZS10, MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship exceeds the academic year's dead-line.

MI-ZS30 Master internship abroad for 30 credits

30

Each student can once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses MI-ZS10, MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship exceeds the academic year's dead-line.

Code of the group: NI-TI-VS.2018

Name of the group: Elective Vocational Courses for Master Specialization Computer Science

Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0

Note on the group:

All compulsory subjects of specializations with the exception of this specialization

Note on the group		iizations with	the exc	epilon o	i ii iis speci	alization.
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
NI-AIB	Algorithms of Information Security Röbert Lórencz, Martin Jure ek, Olha Jure ková Róbert Lórencz Róbert Lórencz (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-ADP	Architecture and Design patterns Jan Zimolka, Ji í Borský, Filip K ikava, Tomáš Chvosta Filip K ikava Filip K ikava (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-AM1	Middleware Architectures 1 Tomáš Vitvar, Jaroslav Kucha Jaroslav Kucha Tomáš Vitvar (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-AM2	Middleware Architectures 2 Tomáš Vitvar, Jaroslav Kucha Jaroslav Kucha Tomáš Vitvar (Gar.)	Z,ZK	5	2P+1C	L	V
NI-BML	Bayesian Methods for Machine Learning Kamil Dedecius, Ond ej Tichý Ond ej Tichý Kamil Dedecius (Gar.)	KZ	5	2P+1C	L	V
MI-BPR.16	Security and Secure Programming	Z,ZK	5	2P+1C	Z	V
MI-BHW.16	Security and Hardware Martin Novotný	Z,ZK	5	2P+2C	L	V
NI-BVS	Embedded Security Martin Novotný Martin Novotný Martin Novotný (Gar.)	Z,ZK	5	2P+2C	L	V
NI-BKO	Error Control Codes Pavel Kubalík, Alois Pluhá ek Alois Pluhá ek (Gar.)	Z,ZK	5	2P+1C	L	V
MI-DSV.16	Distributed Systems and Computing	Z,ZK	5	2P+1C	Z	V
MI-DDW.16	Web Data Mining Jaroslav Kucha	Z,ZK	5	2P+1C	L	V
NI-EPC	Effective C++ programming Daniel Langr Daniel Langr (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-FME.16	Formal Methods and Specifications	Z,ZK	5	2P+1C	L	V
MI-FLP	Functional and Logical Programming	Z,ZK	4	2P+1C	L	V
MI-GEN	Code Generators Jan Janoušek	Z,ZK	4	2P+1C	L	V

MI-HWB.16	Hardware Security	Z,ZK	5	2P+2C	L	V
MI-MKY.16	Mathematics for Cryptology Martin Jure ek	Z,ZK	5	3P+1C	L	V
NI-MVI	Computational Intelligence Methods Pavel Kordík Pavel Kordík Pavel Kordík (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-MEP.16	Modelling of Business Processes Robert Pergl	Z,ZK	5	2P+1C	Z	V
NI-MPJ	Modelling of Programming Languages	Z,ZK	5	2P+1C	Z	V
NI-MTI	Modern Internet Technologies Alexandru Moucha, Viktor erný Alexandru Moucha Alexandru Moucha (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-NFA.16	Design for the FPGA and ASIC Technology Jan Schmidt	Z,ZK	5	2P+1C	Z	V
NI-NUR	User Interface Design Josef Pavli ek Josef Pavli ek (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-NSS.16	Normalized Software Systems Robert Pergl	ZK	5	2P	L	V
NI-OSY	Operating Systems and Systems Programming Petr Zemánek, Tomáš Martinec Petr Zemánek Petr Zemánek (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-PAP.16	Parallel Computer Architectures Ivan Sime ek	Z,ZK	5	2P+1C	L	V
NI-BUI	Business Informatics Petra Pavlí ková Petra Pavlí ková (Gar.)	Z,ZK	5	2P+2C	L	V
MI-EDW.16	Enterprise Data Warehouse Systems	Z,ZK	5	2P+1C	L	V
MI-KRY.16	Advanced Cryptology	Z,ZK	5	2P+2C	Z	V
MI-POA.16	Advanced Computer System Architectures	Z,ZK	5	2P+1C	L	V
NI-PAS	Advanced Aspects of Business Zden k Ku era, David Buchtela David Buchtela Zden k Ku era (Gar.)	Z,ZK	4	2P+1C	Z	V
NI-PDB	Advanced Database Systems Michal Valenta, Yelena Trofimova Michal Valenta Michal Valenta (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-PIS.16	Advanced Information Systems	Z,ZK	5	2P+1C	L	V
NI-GPU	GPU Architectures and Programming Ivan Šime ek Ivan Šime ek Ivan Šime ek (Gar.)	Z,ZK	5	2P+1C	L	V
MI-PCM.16	Project And Change Management Petra Pavlí ková	KZ	3	1P+2C	Z,L	V
NI-PDD	Data Preprocessing Marcel Ji ina Marcel Ji ina Marcel Ji ina (Gar.)	Z,ZK	5	2P+1C	Z	V
MI-REV.16	Reverse Engineering	Z,ZK	5	1P+2C	Z	V
MI-RUN.16	Runtime Systems	Z,ZK	5	2P+1C	Z	V
MI-MBI.16	Management of Business Informatics	Z,ZK	5	3P+1C	L	V
MI-SWE.16	Semantic Web	Z,ZK	5	2P+1C	Z	V
MI-SIM.16	Digital Circuit Simulation	Z,ZK	5	2P+1C	L,Z	V
MI-SIB.16	Network Security	Z,ZK	5	2P+1C	L	V
MI-SMI.16	Strategic Management of Informatics Petra Payli koyá	Z,ZK	5	3P+1C	Z	V
MI-SYP.16	Parsing and Compilers	Z,ZK	5	2P+1C	Z	V
MI-SYB.16	Jan Janoušek System Security	Z,ZK	5	2P+2C	L	V
NI-SBF	Simona Forn sek System Security and Forensics	Z,ZK	5	2P+1C	Z	V
MI-SOC.16	Simona Forn sek, Marián Svetlík Simona Forn sek Systems on Chip	Z,ZK	5	2P+1C	Z	V
NI-DSS	Hana Kubátová Decision Support Systems Robert Pergl, Petra Pavlí ková, David Buchtela David Buchtela Robert Port (Cor.)	Z,ZK	5	2P+1C	Z	V
MI-TES.16	Pergl (Gar.) Systems Theory	Z,ZK	5	2P+1C	Z	V
MI-TSP.16	Testing and Reliability	Z,ZK	5	2P+2C		V
NI-TSW	Petr Fišer Software Product Development Petra Pavlí ková Ond ej Pluha Petra Pavlí ková (Gar.)	KZ	4	1P+2C	Z	V
NI-EHW	Embedded Hardware	Z,ZK	5	2P+1C	Z	V
NI-ESW	Jan Schmidt Jan Schmidt (Gar.) Embedded Software Missolar Skrholt Hans Kuhátsvá Missolar Skrholt Hans Kuhátsvá (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-VCC	Miroslav Skrbek, Hana Kubátová Miroslav Skrbek Hana Kubátová (Gar.) Virtualization and Cloud Computing Jan Fool, Tomáš Vandra Tomáš Vandra (Car.)	Z,ZK	5	2P+1C	L	V
	Jan Fesl, Tomáš Vondra Tomáš Vondra Tomáš Vondra (Gar.)					

NI-VMM	Retrieva Tomáš Sko		Jaroslav Kucha	Tomáš Skopal (G	ar.)	Z,ZK	5	2P+1C	Z	V
NI-MCC	Multicor	e CPU Comp	uting	Ivan Šime ek (Gar.		Z,ZK	5	2P+1C	Z	V
MI-W20.16	Web 2.0	-			,	Z,ZK	5	2P+1C	L	V
MI-MDW.16	Web Sei	vices and Mi	iddleware			Z,ZK	5	2P+1C	Z	V
Tomáš Vitvar										
naracteristics of pecialization Cor			of Study Plai	n: Code=NI-TI-V	5.2018 Name	=Elective \	ocation:	al Course	es for Ma	ister
II-MVI	Computation								Z,ZK	5
tudents will understand			•	•			and applicat	ble to many	problems. T	hey will learn
ow these methods wor				mining, control, intellige	en games, optimi	zations, etc.			1/7	
II-PCM.16 his course is presente	Project And (ed in Czech.	nange iviana	gement						KZ	3
II-AIB	Algorithms o	Information S	Security						Z,ZK	5
tudents will get acquai	inted with the algor	thms of secure ke	ey generation and c	cryptographic error (no	t only biometric) d	ata processing	. Furthermo	ore, students	will learn th	ne mathematic
, ,, ,,		,	, ,	ure schemes). Anothe	•		to malware	e detection a	ind the use	of machine
arning in detection sys	stems. The last to	ic includes practi	cal steganographic	methods and attacks	on steganograph	nic systems.				
II-ADP	Architecture	and Design pa	atterns						Z,ZK	5
ne objective of this cou	urse is to provide	tudents with both	n work knowledge a	about the underlying fo	oundations of obje	ect-oriented de	sign and an	nalysis as we	ell as with u	nderstanding
e challenges, issues,	and tradeoffs of a	Ivanced software	design. In the first	part of the course, the	students will refr	esh and deepe	en their kno	wledge of ol	oject-oriente	ed programmi
-	-	-		epresent the best pract	_					
			lesign and analysis	. This includes the clas	sical architectura	l styles, compo	nent based	l systems, ar	nd some adv	anced software
chitectures used in lar										
I-AM1	Middleware A	rchitectures 1	1					2	Z,ZK	5
udents will study new	trends, concepts,	and technologies	in the area of serv	vice-oriented architect	ures. The will gair	an overview o	of information	on system a	chitecture,	web service
chitecture and aplication	ion servers. The wi	l also study princi	ples and technolog	ies for middleware focu	ised on applicatio	n integrations,	asynchrono	ous commun	ications and	l high availab
applications.										
l-AM2	Middleware A	rchitectures 2	2						Z,ZK	5
udents will learn new	trends and techno	logies on the We	h including theoret							nd tochnologi
microsarvicas distru	ibuted seeks and		b including theoret	ical foundations. They	will gain an overv	riew of Web ap	plication are	chitectures,	concepts ar	ia teciniologi
i illiciosei vices, distru	abuteu cacrie ariu	databases, smart	-	ical foundations. They e communication and v	-	riew of Web ap	plication are	chitectures,	concepts ar	ia tecimologi
			-	-	-	riew of Web ap	plication are	chitectures,	KZ	5
II-BML	Bayesian Me	thods for Mac	contracts, realtime	e communication and v	veb security.				KZ	5
II-BML he subject is focused o	Bayesian Me	thods for Mac basic Bayesian m	contracts, realtime chine Learning nodeling methods in	e communication and v	veb security.	ning theory. In	particular, it	t studies the	KZ constructio	5 n of appropria
II-BML ne subject is focused o odels providing descri	Bayesian Me on practical use of iption of real phen	thods for Mac basic Bayesian m omena, as well as	contracts, realtime chine Learning modeling methods in stheir subsequent	n the dynamically evolvuse, e.g., for forecastil	ving machine lear	ning theory. In	particular, it	t studies the	KZ constructio	5 n of appropri
II-BML he subject is focused o odels providing descri om noisy observations	Bayesian Me on practical use of iption of real phen s etc.). The empha	thods for Mac basic Bayesian m omena, as well as is is put on under	contracts, realtime chine Learning nodeling methods in s their subsequent standing of explain	n the dynamically evolvuse, e.g., for forecastiled principles and meth	ving machine learing of future evolutions and their pra	ning theory. In tion or learning ctical adoption	particular, it g about the . For this pu	t studies the hidden varia	KZ construction	5 n of approprisibject position world examp
II-BML he subject is focused of codels providing descripm noisy observations and applications will be	Bayesian Me on practical use of iption of real phen s etc.). The empha	thods for Mac basic Bayesian m omena, as well as is is put on under	contracts, realtime chine Learning nodeling methods in s their subsequent standing of explain	n the dynamically evolvuse, e.g., for forecastiled principles and meth	ving machine learing of future evolutions and their pra	ning theory. In tion or learning ctical adoption	particular, it g about the . For this pu	t studies the hidden varia	KZ construction	5 n of appropria bject position world examp
II-BML he subject is focused of clodels providing descriped monoisy observations applications will become of them.	Bayesian Me on practical use of iption of real phen s etc.). The empha: presented to stud	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance	contracts, realtime chine Learning codeling methods in s their subsequent standing of explain , 2D/3D object trac	n the dynamically evolvuse, e.g., for forecastiled principles and meth	ving machine learing of future evolutions and their pra	ning theory. In tion or learning ctical adoption	particular, it g about the . For this pu	t studies the hidden varia irpose, a nur naging. The	KZ construction bles (true of the number of real students wi	5 n of appropria bject position world examp Il try to solve
II-BML he subject is focused of codels providing description om noisy observations and applications will become of them. II-BPR.16	Bayesian Me on practical use of iption of real phen is etc.). The empha- presented to stud	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance	contracts, realtime chine Learning modeling methods in stheir subsequent standing of explain , 2D/3D object trac	n the dynamically evolvuse, e.g., for forecasting principles and methoding, radiation source	ving machine lear ng of future evolutions and their pra term estimation,	ning theory. In tion or learning ctical adoption or separation in	particular, it g about the . For this pu n medical in	t studies the hidden varia irpose, a nur naging. The	KZ construction co	5 n of appropria bject position world examp Il try to solve
II-BML he subject is focused of loadels providing description on noisy observations and applications will be some of them. II-BPR.16 he students will learn he	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study Security and how to assess second	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how	contracts, realtime chine Learning modeling methods in s their subsequent standing of explain , 2D/3D object trac ramming v to take them into	e communication and vanithe dynamically evolvance, e.g., for forecasting and method principles and method in the design paccount in the d	ving machine learing of future evolutions and their praterm estimation, where the control of their own	ning theory. In tion or learning ctical adoption or separation in	particular, it g about the . For this pu n medical in	t studies the hidden varia irpose, a nur naging. The getting fami	KZ construction co	5 n of appropriibject positior world examp Il try to solve
II-BML the subject is focused of codels providing description of them. II-BPR.16 the students will learn the corp, students gain properties.	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study Security and how to assess secretical experience	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog	contracts, realtime chine Learning modeling methods in stheir subsequent standing of explain , 2D/3D object trace ramming v to take them into a grams with reduced	e communication and vanithe dynamically evolvance, e.g., for forecasting the principles and methods account in the design produced privileges and method	ving machine learing of future evoluted and their praterm estimation, who hase of their owneds of specifying to	ning theory. In tion or learning ctical adoption or separation in a code and solu hese privileges	particular, it g about the . For this pu n medical in tions. After s, since not	t studies the hidden varia irpose, a nur naging. The getting fami every progr	construction ibles (true of the property of real students with the sam needs to	5 n of approprii bject positior world examp Il try to solve 5 threat model o run with
II-BML the subject is focused of codels providing description noisy observations and applications will be ome of them. II-BPR.16 the students will learn be eory, students gain prodministrator privileges.	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to studies a security and how to assess secretical experience. Dangers inheren	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow	contracts, realtime chine Learning modeling methods in s their subsequent standing of explain , 2D/3D object trace camming v to take them into a grams with reduced vs will be practically	n the dynamically evolves, e.g., for forecasting and principles and methods, radiation source account in the design produced by demonstrated. Student in the design produced account in the design produced by demonstrated.	ving machine learing of future evoluted and their praterm estimation, who consider their owners of specifying tents will be introduced.	ning theory. In tion or learning ctical adoption or separation in a code and soluties privileges uced to the prir	particular, it g about the . For this pu n medical in itions. After s, since not nciples of se	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data	construction bles (true of the property of the	5 n of appropria bject positior world examp Il try to solve 5 threat model or run with ationships of
I-BML ne subject is focused of codels providing description noisy observations and applications will be some of them. II-BPR.16 ne students will learn be eory, students gain produministrator privileges.	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess secractical experiences. Dangers inheren systems, web, rem	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal	contracts, realtime chine Learning modeling methods in s their subsequent standing of explain , 2D/3D object trace camming v to take them into a grams with reduced vs will be practically	n the dynamically evolves, e.g., for forecasting and principles and methods, radiation source account in the design produced by demonstrated. Student in the design produced account in the design produced by demonstrated.	ving machine learing of future evoluted and their praterm estimation, who consider their owners of specifying tents will be introduced.	ning theory. In tion or learning ctical adoption or separation in a code and soluties privileges uced to the prir	particular, it g about the . For this pu n medical in itions. After s, since not nciples of se	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens	KZ constructio bles (true o nber of real students wi Z,ZK liar with the am needs tr and the rel e against th	5 n of appropria bject positior world examp Il try to solve 5 threat model or un with ationships of em.
I-BML ne subject is focused of codels providing description noisy observations and applications will be ome of them. II-BPR.16 ne students will learn heory, students gain prodministrator privileges, eccurity and database s	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess secretical experience. Dangers inheren systems, web, rem	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware	contracts, realtime thine Learning modeling methods in their subsequent standing of explain and 2D/3D object traces amming to take them into a grams with reduced we will be practically and sockets in a substantial standard and sockets in a substantial substa	n the dynamically evolves, e.g., for forecasting the principles and methods, radiation source account in the design produced privileges and methods are demonstrated. Studen general. The module control of the privileges and methods are demonstrated.	veb security. ving machine learing of future evolutions and their praterm estimation, what of specifying the ents will be introduced oncludes with De	ning theory. In tion or learning ctical adoption or separation in code and solutes privileges uced to the prir nial of Service	particular, it g about the . For this pu n medical in ations. After s, since not noiples of se attacks and	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens	KZ construction where of real students with the arm needs to and the release against the Z,ZK	5 n of appropria bject positior world examp Il try to solve 5 threat model or un with ationships of em. 5
I-BML ne subject is focused of codels providing description noisy observations and applications will be some of them. II-BPR.16 ne students will learn be eory, students gain produministrator privileges, ecurity and database sill-BHW.16 nudents gain a basic kill	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess secretical experience. Dangers inheren systems, web, rem Security and nowledge in selection products of the security and nowledge in selection.	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and hov with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt	contracts, realtime thine Learning modeling methods in their subsequent standing of explain and 2D/3D object traces armming to to take them into a grams with reduced we will be practically lis, and sockets in the standard contracts are successful to the standard contracts and sockets in the standard contracts.	n the dynamically evolvuse, e.g., for forecastiled principles and metriciples and metriciples, radiation source account in the design properties of demonstrated. Stude general. The module of analysis. The module of	veb security. ving machine learing of future evoluted and their praterm estimation, who considered their owners will be introduced to the concludes with Defocuses particular	ning theory. In tion or learning ctical adoption or separation in code and solution code and solution code to the prinial of Service	particular, it g about the last put in medical in the last put in the last pu	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and o	construction bles (true of the property of the	5 n of appropri- bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks
I-BML ne subject is focused of codels providing description noisy observations and applications will be some of them. II-BPR.16 ne students will learn be eory, students gain produministrator privileges, ecurity and database sill-BHW.16 rudents gain a basic knyptographic systems.	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess secretical experiences. Dangers inheren systems, web, rem Security and mowledge in select Students gain a go	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and hov with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt	contracts, realtime thine Learning modeling methods in their subsequent standing of explain and 2D/3D object traces armming to to take them into a grams with reduced we will be practically lis, and sockets in the standard contracts are successful to the standard contracts and sockets in the standard contracts.	n the dynamically evolvuse, e.g., for forecastiled principles and metriciples and metriciples, radiation source account in the design properties of demonstrated. Stude general. The module of analysis. The module of	veb security. ving machine learing of future evoluted and their praterm estimation, who considered their owners will be introduced to the concludes with Defocuses particular	ning theory. In tion or learning ctical adoption or separation in code and solution code and solution code to the prinial of Service	particular, it g about the last put in medical in the last put in the last pu	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and o	construction bles (true of the property of the	5 n of appropria bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks
II-BML he subject is focused of loodels providing description noisy observations and applications will be loome of them. II-BPR.16 he students will learn heleory, students gain prodministrator privileges, ecurity and database some of the looders gain a basic knowledge of the loome of contents	Bayesian Me on practical use of iption of real phens etc.). The emphasis etc.). The emphasis etc.). The emphasis etc.) The emphasis etc.) The emphasis etc.) The emphasis etc.) The emphasis etc. The emphasis etc	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the	contracts, realtime thine Learning modeling methods in their subsequent standing of explain and 2D/3D object traces armming to to take them into a grams with reduced we will be practically lis, and sockets in the standard contracts are successful to the standard contracts and sockets in the standard contracts.	n the dynamically evolvuse, e.g., for forecastiled principles and metriciples and metriciples, radiation source account in the design properties of demonstrated. Stude general. The module of analysis. The module of	veb security. ving machine learing of future evoluted and their praterm estimation, who considered their owners will be introduced to the concludes with Defocuses particular	ning theory. In tion or learning ctical adoption or separation in code and solution code and solution code to the prinial of Service	particular, it g about the last put in medical in the last put in the last pu	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and d smart cards	construction ibles (true of mober of real students with the arm needs to and the relie against the true of the contemporary and resour and resource and reso	5 n of appropria bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for securi
II-BML he subject is focused of nodels providing descriptions of applications will be ome of them. II-BPR.16 he students will learn before, students gain producing and database so II-BHW.16 tudents gain a basic keryptographic systems. Striptions of colli-BVS	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess section and incomplete in selection in the security and how to assess section and incomplete in selection in the security and nowledge in selection in the security and incomplete in the security	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity	contracts, realtime thine Learning modeling methods in a their subsequent standing of explain and 2D/3D object trace that the standing of explain and the standing of explain and the standing of explain and sockets in a standing the standing of the standi	n the dynamically evolvuse, e.g., for forecastiled principles and methods, radiation source account in the design privileges and method deprivileges and method demonstrated. Stude general. The module canalysis. The module fardware) cryptographic	ving machine learing of future evolutions and their practerm estimation, on the state of specifying the state will be introduced by the state of specifying the specific of specifying the specific of specifying the specific of specific	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prinial of Service	particular, it g about the f. For this pu in medical in attions. After s, since not inciples of se attacks and	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction ibles (true of mber of real students with the arm needs to and the rele e against the Z,ZK on contemper, and resour	5 n of appropria bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for securi
II-BML he subject is focused of lodels providing description moisy observations and applications will be borne of them. III-BPR.16 he students will learn be been, students gain producing and database stronger and database stronger and basic knowledges. Internal functions of colli-BVS tudents gain basic knowledges and basic knowledges.	Bayesian Me on practical use of iption of real phens etc.). The emphasis etc.). The emphasis etc.). The emphasis etc.) The emphasis etc. The emphasis et	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity I topics of cryptog	contracts, realtime thine Learning modeling methods in their subsequent standing of explaint, 2D/3D object trace the standing of explaint, 2D/3D object trace the standing of explaint to take them into a grams with reduced we will be practically list, and sockets in the standing of the	n the dynamically evolvuse, e.g., for forecastiled principles and methods in the design provides and methods account in the design provideges and methods are depriviled by demonstrated. Stude general. The module canalysis. The module fardware) cryptographicallysis. The course focus	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the ents will be introduced includes with Defocuses particular caccelerators, ranses particularly of	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prinnial of Service rly on elliptic cundom number of the efficient impless.	particular, it g about the an endical in the anticons. After s, since not noticiples of se attacks and attacks and attacks and the attacks and	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction ibles (true of mber of real students with the am needs to another release against the Z,ZK on contemper, and resour Z,ZK aphic primiti	5 n of appropria bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for securi
II-BML the subject is focused of codels providing descriptor noisy observations and applications will be ome of them. II-BPR.16 the students will learn the students will learn provided in the students gain provided in the students gain provided in the students gain a basic knowled the students gain a basic knowled in the students gain a basic knowled software (in embedding students gain basic knowled software (in embedding of software (in embedding o	Bayesian Me on practical use of iption of real phens etc.). The emphasis etc.). The emphasis etc.). The emphasis etc.) The emphasis etc. The emphasis et	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity I topics of cryptog	contracts, realtime thine Learning modeling methods in their subsequent standing of explaint, 2D/3D object trace the standing of explaint, 2D/3D object trace the standing of explaint to take them into a grams with reduced we will be practically list, and sockets in the standing of the	n the dynamically evolvuse, e.g., for forecastiled principles and methods in the design provides and methods account in the design provideges and methods are depriviled by demonstrated. Stude general. The module canalysis. The module fardware) cryptographicallysis. The course focus	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the ents will be introduced includes with Defocuses particular caccelerators, ranses particularly of	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prinnial of Service rly on elliptic cundom number of the efficient impless.	particular, it g about the an endical in the anticons. After s, since not noticiples of se attacks and attacks and attacks and the attacks and	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction ibles (true of mber of real students with the am needs to another release against the Z,ZK on contemper, and resour Z,ZK aphic primiti	5 n of approprishject position world examp II try to solve 5 threat model or run with ationships of them. 5 orary attacks coes for secur 5 ves in hardway
II-BML the subject is focused of codels providing description noisy observations and applications will be ome of them. II-BPR.16 the students will learn be every, students gain provided the students gain provided the students gain a basic knowledge of computer systems. Students gain basic knowledge of computer systems.	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study a presented to study and how to assess sectractical experiences. Dangers inheren systems, web, rem Security and nowledge in select Students gain a groomputer systems Embedded Sowledge in selected ded systems). Students Students Students Students Gain a groomputer systems Embedded Sowledge in selected ded systems). Students Student	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity I topics of cryptog lents gain a good	contracts, realtime thine Learning modeling methods in their subsequent standing of explaint, 2D/3D object trace the standing of explaint, 2D/3D object trace the standing of explaint to take them into a grams with reduced we will be practically list, and sockets in the standing of the	n the dynamically evolvuse, e.g., for forecastiled principles and methods in the design provides and methods account in the design provideges and methods are depriviled by demonstrated. Stude general. The module canalysis. The module fardware) cryptographicallysis. The course focus	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the ents will be introduced includes with Defocuses particular caccelerators, ranses particularly of	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prinnial of Service rly on elliptic cundom number of the efficient impless.	particular, it g about the an endical in the anticons. After s, since not noticiples of se attacks and attacks and attacks and the attacks and	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction ibles (true of mber of real students with the arm needs to and the rele e against the Z,ZK on contemper, and resour Z,ZK aphic primiting r securing in	5 n of approprisibject position world examp II try to solve 5 threat model or run with ationships of them. 5 orary attacks oces for secur 5 ves in hardwaternal function
II-BML he subject is focused of loodels providing description noisy observations and applications will be be been from them. III-BPR.16 he students will learn be been, students gain provided the students gain provided by the students gain a basic known of the students gain a basic known of the students gain basic known of the students gain basic known of software (in embedding computer systems.)	Bayesian Me on practical use of iption of real phens etc.). The emphasis etc.). The emphasis etc.). The emphasis etc.) The emphasis etc. The emphasis et	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity I topics of cryptog lents gain a good	contracts, realtime thine Learning modeling methods in their subsequent standing of explaint, 2D/3D object trace the standing of explaint, 2D/3D object trace the standing of explaint to take them into a grams with reduced we will be practically list, and sockets in the standing of the	n the dynamically evolvuse, e.g., for forecastiled principles and methods in the design provides and methods account in the design provideges and methods are depriviled by demonstrated. Stude general. The module canalysis. The module fardware) cryptographicallysis. The course focus	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the ents will be introduced includes with Defocuses particular caccelerators, ranses particularly of	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prinnial of Service rly on elliptic cundom number of the efficient impless.	particular, it g about the an endical in the anticons. After s, since not noticiples of se attacks and attacks and attacks and the attacks and	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction ibles (true of mber of real students with the am needs to another release against the Z,ZK on contemper, and resour Z,ZK aphic primiti	5 n of appropria bject position world exampl Il try to solve 5 threat modeli o run with ationships of em. 5 orary attacks ces for securi
II-BML the subject is focused of codels providing description noisy observations and applications will be ome of them. III-BPR.16 the students will learn heleory, students gain produministrator privileges, ecurity and database students gain a basic known to be a bas	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess sect actical experience. Dangers inheren systems, web, rem Security and nowledge in select computer systems [Embedded Students gain a go computer systems]. Students gain a go computer systems. Embedded Students gain selected ded systems). Stu	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes	contracts, realtime thine Learning modeling methods in their subsequent standing of explain, 2D/3D object trace the standing of explain, 2D/3D object trace the standing of explain to take them into a grams with reduced with the practically list, and sockets in the standard properties of the	a communication and very the communication and very the communication and very the communication and very the communication and the communication and very t	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the small be introduced with Defocuses particular caccelerators, randers and sees particularly or the prographic accelerators.	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prir nial of Service by on elliptic cundom number of the erators, smart	particular, it g about the gradual in medical in medical in attions. After s, since not neciples of se attacks and green erators, ementations cards, and response to the cards of the cards	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction ibles (true of the property of th	5 n of appropria bject positior world examp Il try to solve 5 threat model or un with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function
I-BML ne subject is focused of odels providing description moisy observations and applications will be ome of them. II-BPR.16 ne students will learn heory, students gain produministrator privileges. Security and database students gain a basic knowledge of the company of the course in t	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess sect actical experience. Dangers inheren systems, web, rem Security and nowledge in select computer systems [Embedded Students gain a go computer systems]. Students gain a go computer systems. Embedded Students gain selected ded systems). Stu	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes is ways to detect	contracts, realtime thine Learning modeling methods in their subsequent standing of explain, 2D/3D object trace amming who to take them into a grams with reduced with the practically list, and sockets in the functionality of (his praphy and cruptate overview of functional or correct individual contracts.	a communication and very the communication and very the communication and very the communication and very the communication and the communication and very t	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the small be introduced with Defocuses particular caccelerators, randers and sees particularly or the prographic accelerators.	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prir nial of Service by on elliptic cundom number of the erators, smart	particular, it g about the gradual in medical in medical in attions. After s, since not neciples of se attacks and green erators, ementations cards, and response to the cards of the cards	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards of cryptograresources for titled via char	construction ibles (true of the property of th	5 n of appropria bject positior world examp Il try to solve 5 threat model or un with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function
I-BML ne subject is focused of odels providing description moisy observations and applications will be ome of them. II-BPR.16 ne students will learn heory, students gain produministrator privileges. Security and database students gain a basic knowledge about the company of the course in I-BKO ne goal of the course in II-DSV.16	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess secretatical experience. Dangers inheren systems, web, rem Security and nowledge in select computer systems. Embedded Students gain a go computer systems. Students gain a go computer systems. Embedded Students gain selected ded systems). Students of the selected systems of the selected ded systems. Students of the selected ded systems of the selected ded systems. Students of the selected ded systems of the selected ded	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes is ways to detect ystems and C	contracts, realtime thine Learning modeling methods in their subsequent standing of explain, 2D/3D object trace the standing of explain, 2D/3D object trace the standing of explain to take them into a grams with reduced with the practically list, and sockets in the standard properties of the	a communication and variety of the dynamically evolves, e.g., for forecastic led principles and methods account in the design produced account in the desig	veb security. Ving machine learing of future evoluted and their practerm estimation, who hase of their owneds of specifying the specifying t	ning theory. In tion or learning ctical adoption or separation in code and soluthese privileges uced to the prir nial of Service by on elliptic cundom number of the erators, smarthing into memories	particular, it g about the g about the g about the g. For this put in medical in attions. After s, since not neiples of se attacks and generators, ementations cards, and r	t studies the hidden varia irpose, a nur maging. The getting fami every progrecuring data d the defens graphy, and c smart cards	construction bles (true of the property of the	5 n of approprii bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for secur 5 ves in hardwa atternal function
I-BML ne subject is focused of codels providing description moisy observations and applications will be some of them. III-BPR.16 ne students will learn her eory, students gain producing and database succurity and database succurity and database supprographic systems. Sinternal functions of collaboration of the some o	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and thou to assess secretatical experience. Dangers inheren systems, web, rem Security and nowledge in select students gain a group of the computer systems. Embedded Sowledge in selected ded systems). Students gain a selected ded systems). Students gain selected ded systems.	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow tote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes us ways to detect ystems and C rdination of proce	contracts, realtime thine Learning modeling methods in their subsequent standing of explain, 2D/3D object trace amming who to take them into a grams with reduced we will be practically list, and sockets in the functionality of (his praphy and cryptana overview of functional computing sses in distributed to the contract of the computing sses in distributed to the contract of the computing sses in distributed to the contract of	e communication and van the dynamically evoluse, e.g., for forecasticed principles and methodisting, radiation source account in the design produced design and privileges and methodisting. The module communication and produced analysis. The module for ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors.	veb security. Ving machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the small be introduced with Defocuses particular caccelerators, randered sees particularly or the small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarthinto memories	particular, it g about the an endical in medical in the attions. After s, since not enciples of se attacks and attacks and enciples of second attacks and e	t studies the hidden variation properties of cryptograms of crypto	construction the students with the sam needs to and the release and resour and resource	5 n of approprii bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for secur 5 ves in hardwa atternal function 5 5 communicat
I-BML le subject is focused of odels providing descripments of applications will be me of them. I-BPR.16 le students will learn herory, students gain proministrator privileges. Curity and database so I-BHW.16 ludents gain a basic known of the sort of the sor	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc.). The emphasis etc.). The emphasis presented to study and how to assess secretatical experience. Dangers inherensystems, web, rem Security and nowledge in select computer systems. Embedded Students gain a go computer systems. Embedded Students gain selected ded systems). Students of the control is to present various Distributed Students for control is to present various distributed Students and present va	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes is ways to detect ystems and C rdination of proce	contracts, realtime thine Learning modeling methods in their subsequent standing of explain, 2D/3D object trace amming who to take them into a grams with reduced we will be practically list, and sockets in the functionality of (his praphy and cryptana overview of functional computing sses in distributed to the contract of the computing sses in distributed to the contract of the computing sses in distributed to the contract of	e communication and van the dynamically evoluse, e.g., for forecasticed principles and methodisting, radiation source account in the design produced design and privileges and methodisting. The module communication and produced analysis. The module for ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors.	veb security. Ving machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the small be introduced with Defocuses particular caccelerators, randered sees particularly or the small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarthinto memories	particular, it g about the an endical in medical in the attions. After s, since not enciples of se attacks and attacks and enciples of second attacks and e	t studies the hidden variation properties of cryptograms of crypto	construction the students with the sam needs to and the release and resour and resource	5 n of approprii bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for secur 5 ves in hardwa atternal function 5 5 communicat
I-BML ne subject is focused of codels providing description moisy observations and applications will be some of them. II-BPR.16 ne students will learn her eory, students gain producing and database succurity and database succurity and database subject of the code of th	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc.). The emphasis etc.). The emphasis presented to study and how to assess secretatical experience. Dangers inherensystems, web, rem Security and nowledge in select computer systems. Embedded Students gain a go computer systems. Embedded Students gain selected ded systems). Students of the control is to present various Distributed Students for control is to present various distributed Students and present va	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne	contracts, realtime thine Learning modeling methods in their subsequent standing of explain, 2D/3D object trace amming who to take them into a grams with reduced we will be practically list, and sockets in the functionality of (his praphy and cryptana overview of functional computing sses in distributed to the contract of the computing sses in distributed to the contract of the computing sses in distributed to the contract of	e communication and van the dynamically evoluse, e.g., for forecasticed principles and methodisting, radiation source account in the design produced design and privileges and methodisting. The module communication and produced analysis. The module for ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors.	veb security. Ving machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the small be introduced with Defocuses particular caccelerators, randered sees particularly or the small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations and the small prographic accelerations are small prographic accelerations.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarthinto memories	particular, it g about the an endical in medical in the attions. After s, since not enciples of se attacks and attacks and enciples of second attacks and e	t studies the hidden variation properties of cryptograms of crypto	construction the students with the sam needs to and the release and resour and resource and resourc	5 n of appropria bject positior world examp Il try to solve 5 threat model o run with ationships of em. 5 orary attacks ces for securi 5 tves in hardwa atternal function 5
I-BML ne subject is focused of odels providing description moisy observations and applications will be ome of them. II-BPR.16 ne students will learn hereory, students gain producing and database sucurity and database sucurity and database subject of the subjec	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. The emphasis etc. The emphasis etc. Security and move the empty etc. Security and move etc. Security and emphasis etc. Security and emphasis etc. Security and emphasis etc. Emphasis etc.). The Emphasis etc. Emphasis etc.). The emphasis etc. Emphasis etc. Emphasis etc.). The emphasis etc. Emphasis etc. Emphasis etc. Emphasis etc.). The emphasis etc. Em	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctnes illures. ning	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of the trace was with reduced was will be practically alls, and sockets in the trace of the tra	e communication and van the dynamically evolute, e.g., for forecasting and principles and method in the design process of the dynamical states of the design process of the desi	web security. Ving machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the smill be introduced with Defocuses particular caccelerators, rainses particularly of specifying the smill be introduced by the smill be	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the pririnial of Service by on elliptic cundom number of the erators, smarthinto memories into memories annistic time responses annistic time response annistic time responses annistic time responses annistic time	particular, it g about the g about the graph of the particular. For this pure in medical in the particular in medical in the particular in	t studies the hidden variation properties of cryptogrames of c	construction the students will be students will be students will be am needs to and the release and resour be applied primiting a securing in the securing in	5 n of appropria bject position world examp Il try to solve 5 threat model or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 1 communicat railability of bo
I-BML ne subject is focused of odels providing description noisy observations and applications will be ome of them. II-BPR.16 ne students will learn her eory, students gain producing and database succurity and database succurity and database subject of the students gain a basic known and software (in embedding the computer systems.) II-BVS and software (in embedding the course in the cours	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. It is et	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctner illures. ning hnologies for We	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of the trace was with reduced was will be practically alls, and sockets in the trace of the tra	an the dynamically evolution and very seed, or for forecasting the principles and method in the design process of the privileges and method in the design process of the privileges and method in the design process of the privileges and method in the design process of the privileges and method in the privileges of the prin	web security. In machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the small be introduced by the specific accelerators, rain the specific accelerators accelerators in data stored by seed by nondetermination of the discovered and the security.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarth into memories a processes and ad knowledge.	particular, it g about the g about the graph of the particular. For this pure in medical in the particular in medical in the particular in medical in the particular in the pa	t studies the hidden variation properties of cryptogrames of cryptogrames of cryptogrames of cryptogrames that supside grain and computing programs that supside grain an overland computing programs that supside grain an overland computing programs that supside grain an overland computing programs that supside grain and computing programs and computing progra	construction the students will be students will be students will be am needs to and the release and the release and resour be applied primiting a securing in the securing ind	5 n of appropria bject position world examp Il try to solve 5 threat model or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicat railability of bo
I-BML ne subject is focused of odels providing description noisy observations and applications will be ome of them. II-BPR.16 ne students will learn her eory, students gain produministrator privileges. Security and database in the students gain a basic known of the students gain a basic known of the students gain basic known of	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. Th	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypt od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce a assure correctner illures. ning hnologies for Wel Neb structure and	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of the trace of t	an the dynamically evolution and very seed, or for forecasting the principles and method in the design process of the privileges and method in the design process of the privileges and method in the design process of the privileges and method in the design process of the privileges and method in the privileges of the prin	web security. In machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the small be introduced by the specific accelerators, rain the specific accelerators accelerators in data stored by seed by nondetermination of the discovered and the security.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarth into memories a processes and ad knowledge.	particular, it g about the g about the graph of the particular. For this pure in medical in the particular in medical in the particular in medical in the particular in the pa	t studies the hidden variation properties of cryptogrames of cryptogrames of cryptogrames of cryptogrames that supside grain and computing programs that supside grain an overland computing programs that supside grain an overland computing programs that supside grain an overland computing programs that supside grain and computing programs and computing progra	construction the students will be students will be students will be am needs to and the release and the release and resour be applied primiting a securing in the securing ind	5 n of appropria bject position world examp Il try to solve 5 threat modeli or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communication failability of both 5 //eb mining
I-BML ne subject is focused of odels providing description moisy observations and applications will be ome of them. II-BPR.16 ne students will learn her eory, students gain producing and database survively and database survively and database survively and focus and software (in embedding and basic known and software (in embedding and software (in embedding and software). II-BVS and software (in embedding and software). II-BKO ne goal of the course in the co	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. It is etc.). The emphasis etc. It is etc.). The emphasis etc. It is	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce a assure correctne illures. ning hnologies for We Web structure and web and recomm	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of the trace was will be practically alls, and sockets in the trace of the trace o	an the dynamically evolution and very seed, or for forecasting the principles and method in the design process of the privileges and method in the design process of the privileges and method in the design process of the privileges and method in the design process of the privileges and method in the privileges of the prin	web security. In machine learning of future evoluted and their praterm estimation, who hase of their owneds of specifying the small be introduced by the specific accelerators, rain the specific accelerators accelerators in data stored by seed by nondetermination of the discovered and the security.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarth into memories a processes and ad knowledge.	particular, it g about the g about the graph of the particular. For this pure in medical in the particular in medical in the particular in medical in the particular in the pa	t studies the hidden variation properties of cryptograms of cryptograms that sup ill gain an own s will also gain.	construction bles (true of the property of the	5 n of appropria bject position world examp Il try to solve 5 threat model or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 1 communicat railability of both 5 //eb mining riew of most
II-BML ne subject is focused of odels providing descriptor noisy observations and applications will be ome of them. II-BPR.16 ne students will learn he eory, students gain produministrator privileges, accurity and database students gain a basic known and software (in embedding the computer systems.) II-BVS tudents gain basic known as of the course in the course	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. It is etc.). The emphasis etc. It is etc. It	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of the trace was will be practically alls, and sockets in graphy and crupte functionality of (history) and cryptana overview of function or correct individual computing sees in distributed eass of computation b data acquisition, alysis, Web usage endation systems.	a communication and varies of the dynamically evolutes, e.g., for forecastic led principles and method in the design process of the dynamical privileges and method y demonstrated. Stude general. The module of ardware) cryptographicallysis. The course focus analysis. The course focus analysis and burst errors and burst errors and burst errors are proving a group of analysis and utilization analysis, Web content	ving machine learing of future evoluted and their praterm estimation, who hase of their owneds of specifying the smill be introduced by the specific accelerators, rain the session of the session of the session of the discovered by nondetermonal of the discovered mining and informatical or security.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarth into memories an inistic time residuation extraction extraction.	particular, it g about the g about the graph of the pure trions. After s, since not notiples of se attacks and recorded trive cryptog generators, and records, and records or transmit pronses of credit mechanisms. Students with the pure trions on the pure trions of the pure trion	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data dependent of the defension of th	construction bles (true of the property of the	5 n of appropria bject position world examp Il try to solve 5 threat model or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicate railability of both 5 feb mining riew of most
II-BML the subject is focused of codels providing descriptom noisy observations and applications will be ome of them. II-BPR.16 the students will learn be every, students gain produministrator privileges, accurity and database is students gain a basic known and software (in embedding to the computer systems. II-BKO the goal of the course in the goal of the goal of the course in the goal of the goal	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. It is etc.). The emphasis etc. It is etc.). The emphasis etc. It is	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Neb structure and web and recomm programming tures of contemp	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of the trace was will be practically alls, and sockets in graphy and crupte functionality of (history) and cryptana overview of function or correct individual computing sees in distributed eass of computation b data acquisition, alysis, Web usage endation systems.	a communication and varies are communication and varies and the dynamically evolvates, e.g., for forecastic and principles and method and the design of a privileges and method and the dynamical and the dynamica	ving machine learing of future evoluted and their praterm estimation, who hase of their owneds of specifying the smill be introduced by the specific accelerators, rail sees particularly or the smill be introduced by the specific accelerators accelerators accelerators in data stored seed by nondetermonal for the discovere mining and informanguage for softwarp.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarth into memories an inistic time result processes and ad knowledge. Smation extraction ware development.	particular, it g about the g about the graph of the pure trions. After s, since not notiples of se attacks and record trive cryptog generators, and records, and records or transmit ponses of cred mechanisms. Students with on. Students with the country contract of the contract o	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data dependent of the defension of th	construction bles (true of the property of the	5 n of appropria bject position world exampl Il try to solve 5 threat modeli or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communication atialiability of both 5 //eb mining riew of most
II-BML the subject is focused of codels providing descriptom noisy observations and applications will be ome of them. II-BPR.16 the students will learn be every, students gain produministrator privileges, accurity and database security and software (in embedded to computer systems. II-BVS III-BKO the goal of the course in the goal of the goal of the course in the goal of	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc. Dangers inheren systems, web, rem Security and nowledge in select edcaystems. Students gain a group etc. Students gain a group etc. Embedded Sowledge in selected edcaystems). Students etc. Distributed Sowledge in selected edcaystems. Students etc. Distributed Sown etc. Distributed Sown etc. Error Control is to present various to methods for consiculation and search, the field of social effective C+use the modern fearm of writing maint	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming tures of contemp inable and portal	contracts, realtime thine Learning hodeling methods in their subsequent standing of explain and provided their subsequent standing of explain and sockets in a subsequent	a communication and varies are communication and varies and the dynamically evolvates, e.g., for forecastic and principles and method and the design of a privileges and method and the dynamical and the dynamica	ving machine learing of future evoluted and their praterm estimation, who hase of their owneds of specifying the smill be introduced by the specific accelerators, rail sees particularly or the smill be introduced by the specific accelerators accelerators accelerators in data stored seed by nondetermonal for the discovere mining and informanguage for softwarp.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service and om number of the erators, smarth into memories an inistic time result processes and ad knowledge. Smation extraction ware development.	particular, it g about the g about the graph of the pure trions. After s, since not notiples of se attacks and record trive cryptog generators, and records, and records or transmit ponses of cred mechanisms. Students with on. Students with the country contract of the contract o	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data did the defens graphy, and dismart cards smart cards as of cryptograresources for ted via charmony that sup sill gain an own sill gain	construction bles (true of the property of the	5 n of appropria bject position world exampl Il try to solve 5 threat modeli o run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicati railability of both 6 feb mining riew of most 5 nming effective
II-BML ne subject is focused of odels providing descriptor noisy observations and applications will be ome of them. II-BPR.16 ne students will learn be every, students gain produministrator privileges, accurity and databases in the students gain a basic known of the students gain a basic known of the students gain basic known of the students are introduced to the students are introduced to the students will learn lates considered the students will learn lates considered the students learn how to under the students learn how	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess sect ractical experience. Dangers inheren systems, web, rem Security and nowledge in select Students gain a group ter systems Embedded Sowledge in selected ded systems). Students of the present various Distributed Source and the present various to present various to methods for consiculation and safety in case of for the field of social Effective C+-use the modern fearm of writing maint Formal Methods	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming tures of contemp ainable and portal ods and Spec	contracts, realtime thine Learning todeling methods in their subsequent standing of explain and the standing of explain and sockets in a standing and the s	a communication and varies of the dynamically evolutes, e.g., for forecastic led principles and method in the design process of the dynamical privileges and method y demonstrated. Stude general. The module of ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors are burst errors and burst errors are provinced by a group of analysis and utilization analysis, Web content and creating correct provinced the C++ programming is and creating correct provinced and creati	ving machine learing of future evoluted and their praterm estimation, who hase of their own dos of specifying tents will be introduced by the concludes with Defocuses particular concludes accelerators, raises particularly or prographic accelerators accelerators accelerators in data stored sed by nondetermon of loosely coupled in of the discovere mining and informanguage for softwo grams with low mining and with low mining	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service of the primital of the p	particular, it g about the an endical in medical in medical in medical in a medical in the second process of control of the second process of t	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data did the defens graphy, and dismart cards smart cards as of cryptograresources for ted via charmony that sup the series will gain an own will gain an own similary graphy.	construction bles (true of the property of the	5 n of appropria bject position world exampl Il try to solve 5 threat modeli o run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicati railability of both 5 nming effectiv 5
I-BML ne subject is focused of odels providing description noisy observations and applications will be ome of them. II-BPR.16 ne students will learn her eory, students gain producing the subject is a basic known as a basic kno	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess sect ractical experience. Dangers inheren systems, web, rem Security and nowledge in select Students gain a group ter systems. Embedded Sowledge in selected ded systems). Students of the present various Distributed Sown to methods for consict algorithms that safety in case of for the field of social Effective C+use the modern fearm of writing maint Formal Meth scribe semantics of the students of the present series and the scribe semantics of the present series and the series	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming tures of contemp ainable and portal ods and Spec	contracts, realtime thine Learning todeling methods in their subsequent standing of explain and the standing of explain and sockets in a standing and the s	a communication and varies of the dynamically evolutes, e.g., for forecastic led principles and method in the design process of the dynamical privileges and method y demonstrated. Stude general. The module of ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors are burst errors and burst errors are provinced by a group of analysis and utilization analysis, Web content and creating correct provinced the C++ programming is and creating correct provinced and creati	ving machine learing of future evoluted and their praterm estimation, who hase of their own dos of specifying tents will be introduced by the concludes with Defocuses particular concludes accelerators, raises particularly or prographic accelerators accelerators accelerators in data stored sed by nondetermon of loosely coupled in of the discovere mining and informanguage for softwo grams with low mining and with low mining	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service of the primital of the p	particular, it g about the an endical in medical in medical in medical in a medical in the second process of control of the second process of t	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data did the defens graphy, and dismart cards smart cards as of cryptograresources for ted via charmony that sup the series will gain an own will gain an own similary graphy.	construction bles (true of the property of the	5 n of appropria bject position world exampl Il try to solve 5 threat modeli o run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicati railability of both 5 nming effectiv 5
II-BML The subject is focused to odels providing descriptor noisy observations and applications will be ome of them. II-BPR.16 The students will learn be every, students gain producing the providing states as a security and databases as a students gain a basic known of the providents gain a basic known of the providents gain bas	Bayesian Me on practical use of iption of real phen is etc.). The emphasis etc.). The emphasis etc.). The emphasis etc.). The emphasis presented to study and how to assess secretical experiences. Dangers inheren systems, web, rem Security and mowledge in select of the security and systems. Embedded Students gain a group ter systems. Embedded Sowledge in selected ded systems). Students pain is to present vario Distributed State of the methods for consict algorithms the safety in case of for the security and search, the field of social Effective C+-use the modern fear of writing maint Formal Meth scribe semantics oware.	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming tures of contemp ainable and portal ods and Spec f software formal	contracts, realtime thine Learning odeling methods in their subsequent standing of explain, 2D/3D object trace amming of to take them into a grams with reduced we will be practically alls, and sockets in graphy and crupte functionality of (histography and cryptana overview of function or correct individual computing sees in distributed cass of computation b data acquisition, alysis, Web usage endation systems.	a communication and varies of the dynamically evolutes, e.g., for forecastic led principles and method in the design process of the dynamical privileges and method y demonstrated. Stude general. The module of ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors are burst errors and burst errors are provinced by a group of analysis and utilization analysis, Web content and creating correct provinced the C++ programming is and creating correct provinced and creati	ving machine learing of future evoluted and their praterm estimation, who hase of their own dos of specifying tents will be introduced by the concludes with Defocuses particular concludes accelerators, raises particularly or prographic accelerators accelerators accelerators in data stored sed by nondetermon of loosely coupled in of the discovere mining and informanguage for softwo grams with low mining and with low mining	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service of the primital of the p	particular, it g about the an endical in medical in medical in medical in a medical in the second process of control of the second process of t	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data dependent of the defension of th	construction bles (true of the property of the	5 n of appropria bject position world exampl Il try to solve 5 threat modeli or run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicati railability of both few of most 5 nming effectiv 5 at allow to pro-
II-BML the subject is focused of codels providing descriptom noisy observations and applications will be ome of them. II-BPR.16 the students will learn be every, students gain produministrator privileges, accurity and databases in the students gain a basic known of the students gain a basic known of the students gain basic known of software (in embedded to computer systems.) II-BVS II-BKO the goal of the course in the goal of the go	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess sect ractical experience. Dangers inheren systems, web, rem Security and nowledge in select Students gain a group ter systems. Embedded Sowledge in selected ded systems). Students of the present various Distributed Sown to methods for consict algorithms that safety in case of form the field of social Effective C+-use the modern fearm of writing maint Formal Meth scribe semantics of ware.	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming tures of contemp pinable and portal ods and Spec of software formal	contracts, realtime thine Learning todeling methods in their subsequent standing of explain and the standing of explain and sockets in a standing and the s	a communication and varies of the dynamically evolutes, e.g., for forecastic led principles and method in the design of the dynamical privileges and method y demonstrated. Stude general. The module of ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors are provinced by a group of analysis and utilization analysis, Web content the C++ programming is and creating correct produces and the december of the content of the course for the cou	web security. Ving machine learing of future evoluted and their praterm estimation, who considered the second of specifying the second on cludes with Defocuses particular concludes with Defocuses particular concludes accelerators, randered on the second of the discovered mining and informanguage for softward of corrects.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service of the endom number of the erators, smarth of the primital of Service of the erators, smarth of the erators, smarth of the erators, smarth of the erators of the	particular, it g about the an interest particular, it g about the an interest particular in medical in a medical interest particular i	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data did the defens graphy, and dismart cards so of cryptograresources for ted via charmon that sup graphy and its special graphy and dismart cards smart cards graphy, and dismart cards graphy, and dismart cards so of cryptograresources for the special graphy and graphy are sources for the special graphy and graphy are special graphy and graphy are special graphy and graphy are special graphy are special graphy and graphy are special graphy are special graphy are special graphy and graphy are special graphy a	construction bles (true of the property of the	5 n of appropria bject position world exampl Il try to solve 5 threat modeli o run with ationships of em. 5 orary attacks ces for securi 5 ves in hardwa atternal function 5 I communicati railability of bot 5 nming effectiv 5
NI-BML The subject is focused of nodels providing descriptom noisy observations and applications will be some of them. MI-BPR.16 The students will learn in the students gain a basic known of the students gain a basic known of the students gain basic known of the students are introduced thannels. They learn basic and services, and students will learn lates the students will learn lates the students learn how to use the students learn how to use the students are able to despassic properties of softwom of the students will be acquain th	Bayesian Me on practical use of iption of real phen is etc.). The emphasis presented to study and how to assess sect ractical experience. Dangers inheren systems, web, rem Security and nowledge in select Students gain a group ter systems. Embedded Sowledge in selected ded systems). Students of the present various Distributed Sown to methods for consict algorithms that safety in case of form the field of social Effective C+-use the modern fearm of writing maint Formal Meth scribe semantics of ware.	thods for Mac basic Bayesian m omena, as well as is is put on under ents, for instance. Secure Progr urity risks and how with running prog in buffer overflow ote procedure cal Hardware ed topics of crypto od overview of the ecurity topics of cryptog lents gain a good Codes as ways to detect ystems and C rdination of proce assure correctne illures. ning hnologies for We Web structure and web and recomm programming tures of contemp pinable and portal ods and Spec of software formal	contracts, realtime thine Learning todeling methods in their subsequent standing of explain and the standing of explain and sockets in a standing and the s	a communication and varies of the dynamically evolutes, e.g., for forecastic led principles and method in the design of the dynamical privileges and method y demonstrated. Stude general. The module of ardware) cryptographicallysis. The course focus analysis. The course focus analysis. The course focus analysis and burst errors and burst errors are provinced by a group of analysis and utilization analysis, Web content the C++ programming is and creating correct produces and the december of the content of the course for the cou	web security. Ving machine learing of future evoluted and their praterm estimation, who considered the second of specifying the second on cludes with Defocuses particular concludes with Defocuses particular concludes accelerators, randered on the second of the discovered mining and informanguage for softward of corrects.	ning theory. In tion or learning ctical adoption or separation in a code and soluthese privileges used to the primital of Service of the endom number of the erators, smarth of the primital of Service of the erators, smarth of the erators, smarth of the erators, smarth of the erators of the	particular, it g about the an interest particular, it g about the an interest particular in medical in a medical interest particular i	t studies the hidden varial repose, a nur maging. The getting famile every progrecuring data did the defens graphy, and dismart cards so of cryptograresources for ted via charmon that sup graphy and its special graphy and dismart cards smart cards graphy, and dismart cards graphy, and dismart cards so of cryptograresources for the special graphy and graphy are sources for the special graphy and graphy are special graphy and graphy are special graphy and graphy are special graphy are special graphy and graphy are special graphy are special graphy are special graphy and graphy are special graphy a	construction bles (true of the property of the	5 n of appropria bject position world example Il try to solve 5 threat modelin or run with ationships of em. 5 orary attacks of ces for securin 5 I communication ailability of both few of most 5 I communication fine of most 5 I communication 6 I communication 6 I communication 7 I communication 7 I communication 8 I communication 9 I communication

Students will become acquainted with both theoretical and practical aspects of back-end of an optimizing programming language compiler.

Code Generators

MI-HWB.16 Hardware Security The course provides the knowledge needed for the analysis and design of computer systems security solutions. Students get an overview of safeguards against abuse of the system using hardware means. They will be able to safely use and integrate hardware components into systems and test them for resistance to attacks. Students will gain knowledge about the cryptographic accelerators, PUF, random number generators, smart cards, biometric devices, and devices for internal security functions of the computer. Mathematics for Cryptology Students become familiar with parts of mathematics necessary for deeper understanding of the methods used in symmetric and asymmetric cryptography. They learn the mathematical principles on which security of encryption systems, cryptanalysis methods, cryptography over elliptic curves, and quantum cryptography are based. MI-MEP.16 Modelling of Business Processes The subject is focused on introduction to the discipline of Enterprise Engineering. Students learn the importance of a proper methodological approach for (re)engineering and implementation of processes, organisation structures and information support in big enterprises and institutions. Modelling of Programming Languages Z,ZK 5 The analysis, transformation, and code generation processes depend on the semantics of the language; in particular, they are correct if they preserve the semantics of the language. This course explores the semantics of programming languages. The students will learn the language models with emphasis on functional languages, students are expected to understand the basics of the lambda calculus and here get acquainted with the advanced lambda calculus. The students also get hands-on-experience with semantic modeling and execution tools. NI-MTI Modern Internet Technologies SYNOPSIS The subject "Modern Internet Technologies" is designed on four major pillars of networking: 1. Unified Communication and Collaboration - A single network, oriented on TCP/IP is able to carry whatever types of protocols for whatever purposes. This architecture is able to be protocol independent and carries voice, video and data to achieve seamless integrated services, 2. Design of Extremely Scalable Networks - This provides the insights of network architectures which can accommodate hundreds of millions of users and billions of devices. Thus, there is a paradigm switch from LANs (Local Area Networks) to SPs (Service Providers). 3. Traffic Segregation, Traffic Matching and Traffic Prioritisation - These technologies allow service providers to create private channels of communication between customers, with guaranteed parameters (bandwidth, delay, jitter, type of protocol). 4. Acceleration Technologies - They allow traffic to be carried at the optimal speed and allow for graceful degradation of service parameters in case of failures. Design for the FPGA and ASIC Technology Students gain the basic knowledge needed to start a career in a design house. They will understand the FPGA and ASIC implementation technologies and the limitations that the technologies impose on the design. They are able to perform and to manage typical workflows, their analytic and synthetic steps, with an emphasis on basic verification. They know the structure and demands of software tools, as well as what to expect from them. NI-NUR User Interface Design Z.ZK 5 Students will understand the theorical background of human-computer interaction and user interface (UI) design, will learn formal description of UIs, formal user models, the fundamental notions and procesures. They get acquainted with graphical, speech, and multimodal UIs. Thanks to the gained knowledge, the students will be able to design advanced UIs Normalized Software Systems ZK Students will learn the foundations of Normalized Systems theory, which studies the evolvability of modular structures based on concepts from engineering such as stability from systems theory and entropy from thermodynamics. Initially, the theory was developed at the level of software architectures, where the concept of stability was translated into the definition of so-called combinatorial effects. These effects occur when the impact of a change to the software architecture is dependent on the change itself, as well as on the size of the system. The latter is highly undesirable, as it will cause even a simple change to incur an ever-increasing impact as the size of the system grows over time. As such, combinatorial effects can be considered as a main cause of Lehman?s Law of Increasing Complexity (see, e.g., http://en.wikipedia.org/wiki/Lehman's_laws_of_software_evolution). Additionally, the concept of entropy was used in the study of which micro-states in a modular structure correspond with a given macro-state. This is related mainly to issues such as testing in software architectures. Normalized Systems theory consists first of a set of principles which indicate where violations of stability and entropy-related issues occur in any given software architecture. These principles indicate that very fine-grained modular structures are required in order to control them. In the second part of the theoretical framework, it is shown how software architectures can be constructed based on a set of 5 design patterns called elements. These elements provide the core functionality of information systems in terms of storing data, executing actions, workflows, connectors and triggers, while controlling for violations of the stability and entropy-related principles, allowing them to realize new levels of evolvability in software architectures. Recently, Normalized Systems theory was also applied to the modular structures in business processes and enterprise architectures, with the goal of constructing a foundational theory for Enterprise Engineering. NI-OSY Operating Systems and Systems Programming Z.ZK The course covers system programming in UNIX environment. Emphasis is given on kernel development with focus on kernel architecture and kernel data structures. Key topics are: process management, memory management, file operations and architecture of modern file systems, device drivers and network programming. The course also addresses kernel development process, upgrades of existing kernels, kernel booting, debugging using dynamic instrumentation, and techniques to guarantee portability. Specifics of kernel architecture in embedded and real-time operating systems are also discussed. Theoretical and general principles are demonstrated on the LINUX kernel. Within labs, students will work on projects focused on development of LINUX kernel modules. MI-PAP.16 Parallel Computer Architectures Z.ZK 5 The students gain a good overview of present parallel architectures and processors parallel (ILP) microarchitectures, multithreaded and multicore processors, SoCs and MPSoCs, GPUs, and neural processors. Students also get hands-on experience with programming these systems. NI-BUI **Business Informatics** The aim of the course is to focus on operational, tactical and strategic management of business informatics. Students will gain knowledge in the areas of business process management, ICT services and architectures in enterprise informatics. They will also learn about the principles, models and standards (ITIL, COBIT) in IT management, and lifecycle management of ICT services and resource management (sourcing). Students will learn the process of creating and implementing information strategy, IT Governance, the importance of ICT for business and the context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management, revenue and investment management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). **Enterprise Data Warehouse Systems** The Enterprise Data Warehouses course focuses on the area of business intelligence. Students will be introduced to business intelligence methods and will gain practical knowledge not only in designing warehouses and various architectures, but also their deployment and maintenance. This course also includes an introduction to the area of reporting and data visualization. MI-KRY 16 Advanced Cryptology Students will learn the essentials of cryptanalysis and the mathematical principles of constructing symmetric and asymmetric ciphers. They will know the mathematical principles of random number generators. They will have an overview of cryptanalysis methods, elliptic curve cryptography and quantum cryptography, which they can apply to the integration of their own systems or to the creation of their own software solutions. MI-POA.16 **Advanced Computer System Architectures** Z,ZK The student will learn the current trends in infrastructure architecture of complex business computer systems. After completion of the module, the student will be able to design a complex system infrastructure that meets availability and scalability requirements given by the business environment. NI-PAS 4 **Advanced Aspects of Business** 7.7K The aim of the course is to provide students with advanced (compared to the bachelor's degree) knowledge and skills needed to establish and run their own business or business management, especially in law, administration (necessary steps and documents), business economics, foreign trade and related aspects. NI-PDB Advanced Database Systems Z,ZK 5 Students orient themselves in problems of evaluation and optimization of SQL queries. The next part of the course deals with new concepts of database machines (so called NoSQL databases), with the related new data models (XML, graph databases, column databases) and languages for working with them (XQuery, XPath, CYPHER, Gremlin). The last part of the course deals with performance evaluation of database machines.

MI-PIS.16 Advanced Information Systems	Z,ZK	5
Students learn the notion of business process logic and its formalization, with business process roles, business rules, and data processing enterprise services and service solution of business logic. They get acquainted with these notions also for the other types of ISs. They let	•	
artificial intelligence methods for implementation of these ideas in ISs. They understand modern object-oriented methodologies for mode	- · · · · · · · · · · · · · · · · · · ·	-
processed data, and enterprise ISs. They will get the rules and technologies for successful implementation of IS.		
NI-GPU GPU Architectures and Programming	Z,ZK	5
Students will gain knowledge of the internal architecture of modern massively parallel GPU processors. They will learn to program them m		-
which is already a widespread programming technology of GPU processors. As an integral part of the effective computational use of these I will also learn optimization programming techniques and methods of programming multiprocessor GPU systems.	hierarchical computational st	ructures, students
NI-PDD Data Preprocessing	Z.ZK	5
Students learn to prepare raw data for further processing and analysis. They learn what algorithms can be used to extract information from	1 '	-
time series, etc., and learn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction		_
pages.		
MI-REV.16 Reverse Engineering	Z,ZK	5
Students will get acquainted with the essentials of reverse engineering of computer software. They will learn how processes start and wh		
is called. Students will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course will enter with a course will enter a course with a		
applications written in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course v debuggers and debugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on		
the course is on the seminars, where students will solve practically oriented tasks from the real world.	rano compater manare coe.	
MI-RUN.16 Runtime Systems	Z,ZK	5
Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming languages.	, ,	1
MI-MBI.16 Management of Business Informatics	Z,ZK	5
This course is presented in Czech.		·
MI-SWE.16 Semantic Web	Z,ZK	5
Students learn standards used for processing and sharing knowledge mainly in the area of web. They get used to designing and using k		•
and practical aspects as publishing, sharing, exchange, and acquisition of knowledge on the web. The presentation is based on the idea and technologies (RDF, RDFS, OWL) and formal models.	of the semantic web, includ	ing its standards
MI-SIM.16 Digital Circuit Simulation	Z.ZK	5
Students gain information regarding the usage of basic tools for the design and simulation of VLSI (very large scale integration) digital ci	1 '	1 -
knowledge about advanced tools System Verilog & Dystem C.	, , , , ,	3
MI-SIB.16 Network Security	Z,ZK	5
The students will gain theoretical and practical knowledge and experience in the area of current security threats in computer networks, s	specifically about detection a	nd defense. The
The stade the will gain theoretical and practical knowledge and experience in the area of earlier security threaten in compater networks, a		
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou		
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered to the covered to the course covered to the cover		
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response).	ers general principals of han	dling detected
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covereurity events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics	ers general principals of han	dling detected
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covereurity events (i.e. incident handling and incident response).	zers general principals of han Z,ZK n of an information strategy,	5 IT governance,
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cover security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation	Z,ZK n of an information strategy, ain the knowledge in the area	5 IT governance, as of economic
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course consecurity events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics.	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO)	5 IT governance, as of economic . The part of the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course consecurity events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO)	5 IT governance, as of economic. The part of the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO)	5 IT governance, as of economic. The part of the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant	5 IT governance, as of economic. The part of the 5 s and applications
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gate management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK	5 IT governance, as of economic. The part of the 5 s and applications
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection again	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gat management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical networks.	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection againords and certificates. After the	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gat management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection agai ords and certificates. After the 1) based solutions. They will a	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications.	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection againords and certificates. After the 1) based solutions. They will a f IT security and will be able	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection agai ords and certificates. After the 1) based solutions. They will a f IT security and will be able Z,ZK	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gate management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwollearn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection agai ords and certificates. After the 1) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts).	5 IT governance, as of economic. The part of the 5 and applications 5 and applications 5 as them, togethe at, students will also learn the to apply it to the 5 Furthermore,
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gath management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with forensic analysis as a tool for investigating security incidents (techniques used by malicious software/attack)	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection agai ords and certificates. After the 1) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts).	5 IT governance, as of economic. The part of the 5 and applications 5 and applications 5 as them, togethe at, students will also learn the to apply it to the 5 Furthermore,
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cowsecurity events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gate management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with forensic analysis as a tool	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection againords and certificates. After the 1) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te	5 IT governance, as of economic. The part of the 5 s and applications 5 s and applications 4 s at, students will also learn the to apply it to the 5 Furthermore, chniques and the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gath management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with forensic analysis as a tool for investigating security incidents (techniques used by malicious software/attack)	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the 1) based solutions. They will a f IT security and will be able Z,ZK ks, authentication concepts). kers and forensic analysis te	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gate management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system se	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the 1) based solutions. They will a f IT security and will be able Z,ZK ks, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the 5 g their parts. They
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cowsecurity events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gas management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security System Security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security (principles of end station security, principles of	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the 5 g their parts. They
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cowsecurity events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gath management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the I) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the sylverification and
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cow security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ga management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security (p	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the I) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the 5 g their parts. They as verification and 5 d, model-oriented
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gamanagement of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of security websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with forensic analysis as a tool for investigating security incidents (techniques used by malicious software/attack importance of operating systems or Chip Students gain key knowl	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates. They will a f IT security and will be able z,ZK ls, authentication concepts). It is and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the 5 g their parts. They as verification and 5 d, model-oriented
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Sudents will get familiar with forensic analysis as a tool for investigating security principles of security policies, security model students will get familiar with spects of system security (principl	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the I) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn al and algorithms.	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the sylvariance sylvariance sylvariance of the principles out the principles of the sylvariance of the principles of the sylvariance of the sylv
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cover security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with proensic analysis as a tool	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the process of the content of th	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the sylverification and sylverification and the cout the principles
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course covered security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Sudents will get familiar with forensic analysis as a tool for investigating security principles of security policies, security model students will get familiar with spects of system security (principl	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the I) based solutions. They will a f IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn al and algorithms. Z,ZK ants). However, the costs of respectively.	5 IT governance, as of economic The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the sylvain parts. They as verification and 5 d, model-oriented pout the principles 5 nanaging this
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cov security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge ananagement of IS/IT, management of investments and ROI, assessement of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of security websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates. They will a fIT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all and algorithms. Z,ZK ants). However, the costs of residuals and designed that designed the costs of residuals and algorithms.	5 IT governance, as of economic. The part of the 5 s and applications 1 s and applications 5 s and applications 5 s and applications 1
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cov security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwor learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of security websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with forensic analysis as a tool fo	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of Various variant Z,ZK knowledge of various variant Z,ZK knowledge of various variant I) based solutions. They will a fIT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all and algorithms. Z,ZK ants). However, the costs of residuals the detection of the sage of models that detect theory and algorithms that the theory and algorithms that the sage of models that detection of the sage of models that detection of the sage of models that detection is the usage of model	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the sylvarian sylvariant parts. They as verification and 5 d, model-oriented cout the principles and the sescribe only those form the basis for
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cov security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gat management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security principles of end station security, principles of security policies, security model students will get familiar with aspects of system security in	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates. They will a fIT security and will be able z,ZK ls, authentication concepts). It is and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all and algorithms. Z,ZK ants). However, the costs of residue theory and algorithms that determined theory and algorithms that the z,ZK	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the sylvarian parts. They as verification and the court the principles of the principles of the parts form the basis for the basis for the basis for the parts.
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course coving security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of security websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates. They will af IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all and algorithms. Z,ZK ants). However, the costs of residence in the usage of models that detent theory and algorithms that it theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent all all all all all all all all all al	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the service out the principles out the principles of the basis for the basis for the basis for the basis for the belief the point the basis for the belief the point the basis for
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course cov security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of Information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques are passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with forensic analysis as a tool for investigating security incidents (techniques used by malicious software/attack importance of operating system/operating system ariffacts of fil	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates. They will af IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all and algorithms. Z,ZK ants). However, the costs of residence in the usage of models that detent theory and algorithms that it theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent all all all all all all all all all al	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the service out the principles out the principles of the basis for the basis for the basis for the basis for the belief the point the basis for the belief the point the basis for
course explains basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspiciou explanation and practical examples of various mechanisms of securing network infrastructure and detection in real time. The course coving security events (i.e. incident handling and incident response). MI-SMI.16 Strategic Management of Informatics The course focuses on the strategic management of information systems. Students will learn the process of creation and implementation the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they ge management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (course is the role of project management, risk management and quality assessment of informatics. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SYB.16 System Security Students will familiarize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network with essential communication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwo learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM principles of security websites, web applications and databases. Upon completion of the module, students will have a broad overview of integration of various software systems and applications. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security model students will get familiar with aspects of system security	Z,ZK n of an information strategy, ain the knowledge in the area (the role of CIO, CEO, CFO) Z,ZK knowledge of various variant Z,ZK knowledge of various variant Z,ZK k attacks and protection again ords and certificates. After the ords and certificates. They will af IT security and will be able Z,ZK ls, authentication concepts). kers and forensic analysis te Z,ZK ns and communication amon rary methods of large system Z,ZK ted principles of data-oriente theory. They will also learn all and algorithms. Z,ZK ants). However, the costs of residence in the usage of models that detent theory and algorithms that it theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent theory and algorithms that it is able to prepare a test set will also be a consideration of the usage of models that detent all all all all all all all all all al	5 IT governance, as of economic. The part of the 5 s and applications 5 nst them, togethe at, students will also learn the to apply it to the 5 Furthermore, chniques and the service out the principles out the principles of the basis for the basis for the basis for the basis for the belief the point the basis for the belief the point the basis for

NI-EHW **Embedded Hardware** The course brings basic laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the base of advanced embedded systems, that profit from their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed, including standardized means of internal communication, parallelism extraction and utilization in special structures and system architectures. **Embedded Software** Embedded software course acquainted students with the specifics of software development for embedded systems. The course covers the areas from the basic techniques of programming in C language and code optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, up to sophisticated techniques combined with artificial intelligence. NI-VCC Virtualization and Cloud Computing Students will gain knowledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and organizations. They will get acquainted with virtualization principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficiently operate and optimize the performance parameters of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective technology today for the management of complex computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skills in the use of modern integration and development tools (Continuous integration and development). NI-APR Selected Methods for Program Analysis Z.ZK Program analysis studies program behavior with the aim of code optimization and error detection. Students will learn static program analysis, which approximates program behavior without the need to actually run the program, as well as dynamic program analysis which analyse programs at runtime. Students will be introduced to the common techniques and algorithms and use them on some classical problems. Z.ZK Retrieval from Multimedia The student obtains general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature extraction from multimedia objects, indexing, and structure of distributed search engines. Multicore CPU Computing Students will get acquainted in detail with hardware support and programming technologies for the creation of parallel multithreaded computations on multicore processors with shared and virtually shared memories, which are today the most common computing nodes of powerful (super)computer systems. Students will gain knowledge of architecturally specific optimization techniques used to reduce the performance drop due to the widening gap between the computational requirements of multi-core CPUs and memory interface throughput. On specific non-trivial multithreaded programs, students will also learn the basics of the art of creating these applications. MI-W20.16 Web 2.0 Students will learn new trends and technologies on the Web including theoretical foundations. Students will gain an overview about Web applications architectures, concepts and technologies about programmable Web (REST Architectures, Mashups), basic mechanisms for knowledge representation on the Web (microformats, meta-data, ontologies, open linked data, etc.), mechanisms about collective intelligence (collaborative filtering, predictions of users' behaviours), social networks, and security. Web Services and Middleware

List of courses of this pass:

Completion Credits

Name of the course

Code

Students learn new trends and technologies in the area of service-oriented architectures, web services, middleware, and cloud computing, including their theoretical background.

		•	
BI-SOJ	Machine Oriented Languages	Z,ZK	4
Students of the co	urse will gain an ability to create their own programs in the assembly language of the most common PC platform focusing on optimal us	e of microprocess	or's features
and efficient coop	eration of software with hardware. Next, there will be discussed x86 specifics of the majority of OSes from the application point of view lin	nked to higher leve	el languages.
	This knowledge will be used during reverse engineering, optimization, and evaluation of code security.		
BI-SVZ	Machine vision and image processing	Z,ZK	5
Camera systems	are becoming a common part of life by being universally available. Related to this phenomenon is the need to process and evaluate in	mage information.	The course
introduces studen	ts 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 system	ns for solving
	problems of practice that the graduates may encounter.		
BI-VMM	Selected Mathematical Methods	Z,ZK	4
We start reviewi	ng geometric properties of linear spaces with inner product. Next, we introduce and analyze the discrete Fourier transform (DFT) and i	ts fast implementa	ation (FFT).
Further we deal	with differential calculus of functions involving multiple variables. We present methods for the localization of extreme values of functions	s. For this purpose	es, we study
normed linear spa	ices and quadratic forms. In addition, we introduce the least square method. The last part of the course is devoted to optimization and c	luality. The linear p	orogramming
	and the Simplex method is analyzed in more detail.		
FI-KSA	Cultural and Social Anthropology	ZK	2
	r course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversit	v of the world - ex	amples from
	esearch from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, healt	•	•
	shown. The course is an interesting alternative to other humanities, taught at FIT.	.,, ,, .	,
FI-MPL	Managerial Psychology	ZK	2
FI-ULI	Introduction to Linguistics for Computer	ZK	2
	This course is presented in Czech.	1 —	. –
MI-AFP	Applied Functional Programming	KZ	5
	zented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional p	1	1
•	rs and the functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master		•
Í	necessary competence of a software engineer: the theory and especially the practice.	0 1 0	
MI-APH	Architecture of computer games	Z.ZK	4
	a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of	_,	1
_	ed architecture, game mechanics, and game Al that form an integral part of most games. They will also understand the basics of pathfin		
	and apply them in practical exercises (labs).	3,	
MI-ARI	Computer arithmetic	Z.ZK	4
	Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementa	,	

MI-ATH	Combinatorial Theories of Games This course is presented in Czech.	Z,ZK	4
MI-BHW.16	Security and Hardware	Z,ZK	5
_	sic knowledge in selected topics of cryptography and cruptanalysis. The module focuses particularly on elliptic curve cryptography, ar ems. Students gain a good overview of the functionality of (hardware) cryptographic accelerators, random number generators, smart car of internal functions of computer systems.	•	-
MI-BML	Bayesian Methods for Machine Learning	KZ	5
The subject is focus models providing from noisy observa	sed on practical use of basic Bayesian modeling methods in the dynamically evolving machine learning theory. In particular, it studies in description of real phenomena, as well as their subsequent use, e.g., for forecasting of future evolution or learning about the hidden be tions etc.). The emphasis is put on understanding of explained principles and methods and their practical adoption. For this purpose, a will be presented to students, for instance, 2D/3D object tracking, radiation source term estimation, or separation in medical imaging. some of them.	variables (true objournment)	ect position Id examples
MI-BPR.16	Security and Secure Programming	Z,ZK	5
theory, students administrator priv security and	arn how to assess security risks and how to take them into account in the design phase of their own code and solutions. After getting far gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every 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	program needs to data and the relat e defense against	run with ionships of them.
MI-BPS	Wireless Computer Networks	Z,ZK	4
	n about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad nisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowle for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitab	edge of security m	
MI-DDM	Distributed Data Mining	KZ	4
Course focuses or	I state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hands of samework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementations a approaches to parallelize other algorithms. The course is prezented in czech language.	on experience with	large scale
MI-DDW.16	Web Data Mining	Z,ZK	5
	irn latest methods and technologies for Web data acquisition, analysis and utilization of the discovered knowledge. Students will gain eb crawling and search, Web structure analysis, Web usage analysis, Web content mining and information extraction. Students will al recent developments in the field of social web and recommendation systems.		_
· ·	Advanced .NET e a knowledge about advanced desgin of applicatios on a .NET platform. They gain skills of WPF (Windows Presentation Foundation) mmunication Foundation) and Entity Framework. They are able to apply these skills on a development and desgin of advanced .NET		4 Windows
MI-DSP	Database Systems in Practes	Z,ZK	4
MI-DSV.16	This course is presented in Czech. Distributed Systems and Computing	Z,ZK	5
	positionated Systems and Computing uced to methods for coordination of processes in distributed environment characterised by nondeterministic time responses of computing	•	1
channels. They lea	rn basic algorithms that assure correctness of computations realized by a group of loosely coupled processes and mechanisms that s data and services, and safety in case of failures.	upport high availa	bility of both
MI-DZO	Digital Image Processing	Z,ZK	4
implement and hav of digital image frequency domain, interactive as-ri MI-EDW.16 The Enterprise Da	ents a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical algorie an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is also 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 convigid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, at a sequence of the properties	so valuable outside compression, de- ersion, context er dding depth, alpha Z,ZK I will gain practica	e the domain blurring in hancement, matting. 5 I knowledge
MIEVOVAC	visualization.	7 71/	
MI-EVY.16 Students get knowl	Efficient Text Pattern Matching edge of efficient algorithms for text pattern matching. They learn to use so called succinct data structures that are efficient in both acces They will be able to use the knowledge in design of applications that utilize pattern matching.	Z,ZK s time and memor	5 complexity.
MI-FLP Students v	Functional and Logical Programming vill be acquainted with principles of functional and logic programming. They will be able to write their programs in Lisp and Prolog pro	Z,ZK gramming langua	d ges.
MI-FME.16	Formal Methods and Specifications	Z,ZK	5
	o describe semantics of software formally and to use sound reasoning for construction of correct software. They learn to use some so basic properties of software.		llow to prove
MI-GAK	Graph theory and combinatorics	Z,ZK	5
on undestanding th	ss is to introduce the most important topics in graph theory, combinatorics, combinatorial structures, discrete models and algorithms. e basic principles but also on applications in problem solving and algorithm design. The topics include: generating functions, selected top heory, introduction to probabilistic method, properties of various special classes of graphs and combinatorial structures. The theory we	ics from graph and	d hypergraph
MI-GEN	of combinatorics on words, formal languages and bioinformatics. Code Generators Students will become acquainted with both theoretical and practical aspects of back-end of an optimizing programming language of the company of the c	Z,ZK	4
MI-GLR	Games and reinforcement learning	Z,ZK	4
	cement learning is very hot recently, because of advances in deep learning, recurrent neural networks and general artificial intelligen	ce. This course is	1
The field of feithor	give you both theoretical and practical background so you can participate in related research activities. Presented in English	٦.	
MI-HMI2	give you both theoretical and practical background so you can participate in related research activities. Presented in English History of Mathematics and Informatics	n. ZK	3

MI-HWB.16	Hardware Security	Z,ZK	5
•	es the knowledge needed for the analysis and design of computer systems security solutions. Students get an overview of safeguards	-	- 1
•	eans. They will be able to safely use and integrate hardware components into systems and test them for resistance to attacks. Studer yptographic accelerators, PUF, random number generators, smart cards, biometric devices, and devices for internal security functions	•	dge about
MI-IBE	Information Security	ZK	2
	prmation and IS/ICT security management systems (ISMS), methods for information access control, and basic norms and internation		
understar	d methods for management of internal and external security threats, for IS/IT security audits, and for application security testing (e.g.	, penetration testing	g).
MI-IKM	Internet and Classification Methods	Z,ZK	4
	students get acquainted with classification methods used in four important internet, or generally network applications: in spam filtering ion systems and in intrusion detection systems. However, they will learn more than only how classification is performed when solving		- 1
	d of these applications, they get an overview of the fundamentals of classification methods. The course is taught in a 2-weeks cycle w		
•	During the exercises, the students on the one hand implement simple examples to topics from the lectures, on the other hand consult		
MI-IOS	Advanced techniques in iOS applications	KZ	4
Students will learn	the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the baselinest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the baselinest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the baselinest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the baselinest trends in mobile development technologies for iOS platform.	asics from the begin	nners class
MI-IOT	Internet of Things	Z,ZK	4
	ocused on the area of hardware and software technologies for the strongly growing computer support of various devices. Its goal is fa	, ,	vailable
	development elements (Raspberry Pi, Arduino Due) and with the language for efficient application development and modification (G		
MI-IVS	Intelligent embedded systems	KZ	4
	led systems course for master's degree is focused on high-level technology embedded systems integrating artificial intelligence. The imbedded system fundamentals course for the bachelor degree. The aim of the course is to teach students humanoid robot programn		
Ü	ures provide basis of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students of	0	• • • • • • • • • • • • • • • • • • • •
-	combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web technologies.	nologies	
MI-KOD.16	Data Compression	Z,ZK	5
	oduced to the basic principles of data compression. They will learn the necessary theoretical background and get an overview of data	•	٠ ١
used in practice. I	ne overview covers principles of integer coding and of statistical, dictionary, and context data compression methods. In addition, stude lossy data compression methods used in image, audio, and video compression.	ints learn the funda	ineniais oi
MI-KOP	Combinatorial optimization	Z,ZK	5
	gain knowledge and understanding necessary deployment of combinatorial heuristics at a professional level. They will be able not only		lement but
	also to apply and evaluate heuristics for practical problems.		
MI-KRY.16	Advanced Cryptology	Z,ZK	5
	n the essentials of cryptanalysis and the mathematical principles of constructing symmetric and asymmetric ciphers. They will know th generators. They will have an overview of cryptanalysis methods, elliptic curve cryptography and quantum cryptography, which they ca	•	
	their own systems or to the creation of their own software solutions.	a app.y to a.eto	9.4
MI-KYB.16	Cybernality	ZK	5
	uainted with the fundamentals of legislation and international activities in the area of fighting cybercrime. Students will understand the		
	of systems for computer surveillance and traffic monitoring in the cyberspace. Students will also familiarize themselves with hacker active will also discuss the cooperation of the state agencies and subjects dealing with defence of the cyberspace (especially CSIRT and CE		The course
MI-LOM.16	Linear Optimization and Methods	Z,ZK	5
	applications of optimization methods in computer science, economics, and industry. They are aware of practical importance of linear a		- 1
	th optimization software and are familiar with languages used in programming of that software. They get skills in formalization of optimization of optimization software and are familiar with languages used in programming of that software. They get skills in formalization of optimization of optimization software and are familiar with languages used in programming of that software.		
	scheduling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, travelli mics, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. The	-	- 1
issues from econo	in linear programming.	y get offentation in	algoritimis
MI-MAI	Multimedia and Internet	Z,ZK	3
	er principles and technologies for processing and network transmissions of multimedia signals, stereoscopy and visualizations in high		
application areas o	f networked multimedia, transmission formats, interfaces, codecs, technologies for acquisition and reproduction of multimedia data and	technologies for vis	sualizations
MI-MBI.16	and distributed collaboration using networking and immersive environments. Management of Business Informatics	Z,ZK	5
IVII-IVIDI. TO	This course is presented in Czech.	۷,۷۱۲	
MI-MCS	Multicore Systems	KZ	4
	and architecture of systems based on multicore processors with multiple threads per core, structure and usage of cache hierarchy with		- 1
-	lassification, parallel programming technics, simulation and monitoring tools for measurement and optimization of parallel algorithms. grams (Multiple Threads Multiple Data), measure and analyze latency and throughput of parallel algorithms and optimize them for con		
MI-MDW.16	Web Services and Middleware	Z,ZK	5
	ew trends and technologies in the area of service-oriented architectures, web services, middleware, and cloud computing, including t	, ,	
MI-MEP.16	Modelling of Business Processes	Z,ZK	5
The subject is	focused on introduction to the discipline of Enterprise Engineering. Students learn the importance of a proper methodological approa	ch for (re)engineeri	ng and
MI MKV 16	implementation of processes, organisation structures and information support in big enterprises and institutions.	7 7V	
MI-MKY.16 Students become f	Mathematics for Cryptology amiliar with parts of mathematics necessary for deeper understanding of the methods used in symmetric and asymmetric cryptograph	Z,ZK v. Thev learn the ma	5 athematical
	rinciples on which security of encryption systems, cryptanalysis methods, cryptography over elliptic curves, and quantum cryptograph		
MI-MPC	Modern programming in C ++	Z,ZK	5
	to use the modern features of contemporary versions of the C++ programming language for software development. The course focus	· -	g effectivity
	iciency in the form of writing maintainable and portable source code and creating correct programs with low memory and processor t		
MI-MPI The course com	Mathematics for Informatics prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analys	Z,ZK sis. smooth optimiza	7 ation and
	ation. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last top	· ·	
_	r stability analysis. The topics are completed with demonstration of applications in computer science. The course focuses on clear pre		
			

MI-MPR			
	Master Project	Z	7
• •	g of the semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide on partial ta		
-	er. If the requirements they agreed upon are met, the supervisor awards the student an assessment for the course MI-MPR at the en		
) supervisor fills his/her assessment into the paper "Form to award assessment by an external Final theses (FT) supervisor" (for the same that the assessment is registered into the information system (IS) by asking their internal FT opponent to award the as		
,	s, then, ensure that the assessment is registered into the information system (13) by asking their internal F1 opponent to award the as- the external MT supervisor. In the case the FT opponent is external as well, the assessment will be registered to the IS by the head		
	MT. 3. If the FT topic that the student has reserved is rather general, the immediate tasks the supervisor assigns to the student for the	•	
·	aim at fine-tuning the FT topic so that the FTT will be complete and approvable at the end of the semester.		
MI-MPX	Management practice	Z	4
The Student can or	nce, within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the d	perational, tactical	or strategic
=	nent (typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is a		
course guarantor.	In the selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the relative member of the ten management.	tives of the student	(e.g. as a
MI-MSI	member of the top management). Mathematical Structures in Computer Science	7.71/	1
IVII-IVISI	Mathematical Structures in Computer Science Mathematical semantics of programming languages.	Z,ZK	4
MI-MZI	Mathematics for data science	Z,ZK	4
	lents are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in da	· .	
	inear algebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality princ		
	selected notions from probability theory and statistics.		
MI-NFA.16	Design for the FPGA and ASIC Technology	Z,ZK	5
-	e basic knowledge needed to start a career in a design house. They will understand the FPGA and ASIC implementation technologies		
technologies impo	ose on the design. They are able to perform and to manage typical workflows, their analytic and synthetic steps, with an emphasis on	basic verification.	hey know
MI NON 16	the structure and demands of software tools, as well as what to expect from them.	Z,ZK	5
MI-NON.16	Nonlinear Continuous Optimization and Numerical Methods roduced to nonlinear continuous optimization, principles of the most popular methods of optimization and applications of such method	· ·	-
	finite element method and the finite difference method used for solving ordinary and partial differential equations in engineering. They	•	, ,
	quations that arise from discretization of the continuous problems by direct and iterative algorithms. They will also learn to implement		-
	as well as in parallel.		
MI-NSS.16	Normalized Software Systems	ZK	5
	rn the foundations of Normalized Systems theory, which studies the evolvability of modular structures based on concepts from engine	_	-
	d entropy from thermodynamics. Initially, the theory was developed at the level of software architectures, where the concept of stability w		
	natorial effects. These effects occur when the impact of a change to the software architecture is dependent on the change itself, as we undesirable, as it will cause even a simple change to incur an ever-increasing impact as the size of the system grows over time. As s		
	a main cause of Lehman?s Law of Increasing Complexity (see, e.g., http://en.wikipedia.org/wiki/Lehman's_laws_of_software_evolution		
	n the study of which micro-states in a modular structure correspond with a given macro-state. This is related mainly to issues such as te		
Normalized Syste	ms theory consists first of a set of principles which indicate where violations of stability and entropy-related issues occur in any given	software architect	ure. These
	that very fine-grained modular structures are required in order to control them. In the second part of the theoretical framework, it is sho		
	l based on a set of 5 design patterns called elements. These elements provide the core functionality of information systems in terms of s ors and triggers, while controlling for violations of the stability and entropy-related principles, allowing them to realize new levels of evolva	•	٠ ا
	ed Systems theory was also applied to the modular structures in business processes and enterprise architectures, with the goal of con	-	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	for Enterprise Engineering.		
MI-OLI	Linux Drivers	Z,ZK	4
The Linux operating	g system is an important operating system for personal computer and also for embedded systems. Systems on chip and combining po	werful processors	and FPGAs
	ability of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver development		onto Tho
CO	urse provides knowledge of Linux operating system architecture, principles of development of various types drivers, including practica		ents. The
	E#: + D		
MI-PAM	Efficient Preprocessing and Parameterized Algorithms	Z,ZK	4
MI-PAM There are many	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess	Z,ZK sary to solve these	4 problems
MI-PAM There are many of exactly in practice		Z,ZK sary to solve these e can find a commo	4 problems in property
MI-PAM There are many of exactly in practice (parameter) of the	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one	Z,ZK sary to solve these can find a commontially in this (small	4 problems in property parameter
MI-PAM There are many of exactly in practice (parameter) of the land polynomially in	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponents.	Z,ZK sary to solve these e can find a commontially in this (small ne preprocessing of	4 problems on property parameter of the input,
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possiblethora of param	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (pre-	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will esumably) does no	4 problems n property parameter of the input, present a
MI-PAM There are many of exactly in practice (parameter) of the in and polynomially in which is not possiplethora of parameters.	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prowill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation	Z,ZK sary to solve these c can find a common ntially in this (small ne preprocessing on method. We will esumably) does no n schemes.	4 problems in property parameter of the input, present a t exist. We
MI-PAM There are many of exactly in practice (parameter) of the interpretation and polynomially interpretation which is not possible plethora of parameters. MI-PAP.16	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prowill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation Parallel Computer Architectures	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will esumably) does no n schemes. Z,ZK	4 problems in property parameter of the input, present a t exist. We
MI-PAM There are many of exactly in practice (parameter) of the interpretation and polynomially interpretation which is not possible plethora of parameters. MI-PAP.16	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors.	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will esumably) does no n schemes. Z,ZK	4 problems in property parameter of the input, present a t exist. We
MI-PAM There are many of exactly in practice (parameter) of the idea and polynomially in which is not possible plethora of param MI-PAP.16 The students gain	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems.	Z,ZK sary to solve these e can find a commo ntially in this (small ne preprocessing o n method. We will esumably) does no n schemes. Z,ZK cessors, SoCs and	4 problems in property parameter f the input, present a t exist. We 5 MPSoCs,
MI-PAM There are many of exactly in practice (parameter) of the interpretation and polynomially interpretation which is not possible plethora of parameters. MI-PAP.16	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors.	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will esumably) does no n schemes. Z,ZK	4 problems in property parameter of the input, present a t exist. We
MI-PAM There are many of exactly in practice (parameter) of the idea and polynomially in which is not possible plethora of param MI-PAP.16 The students gain	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech.	Z,ZK sary to solve these e can find a commo ntially in this (small ne preprocessing o n method. We will esumably) does no n schemes. Z,ZK cessors, SoCs and	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs,
MI-PAM There are many of exactly in practice (parameter) of the idean of polynomially in which is not possible plethora of param MI-PAP.16 The students gain MI-PCM.16 MI-PDP.16	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does no en schemes. Z,ZK cessors, SoCs and KZ Z,ZK	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3
MI-PAM There are many of exactly in practice (parameter) of the idea and polynomially in which is not possible plethora of param MI-PAP.16 The students gain MI-PCM.16 MI-PDP.16 Due to the develop are becoming ubic	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures In a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parallel quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnectives.	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does no en schemes. Z,ZK cessors, SoCs and KZ Z,ZK lel and distributed attion networks, and	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages
MI-PAM There are many of exactly in practice (parameter) of the idea and polynomially in which is not possible plethora of param MI-PAP.16 The students gain MI-PCM.16 MI-PDP.16 Due to the develop are becoming ubic	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures In a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parallel quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of the programming of shared and distributed memory computers.	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does no en schemes. Z,ZK cessors, SoCs and KZ Z,ZK lel and distributed attion networks, and	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possible plethora of param MI-PAP.16 The students gain MI-PCM.16 MI-PDP.16 Due to the develop are becoming ubic and environments for exactly in practice.	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time bible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures In a good overview of present parallel architectures and processors: parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parallel uitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations.	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does no n schemes. Z,ZK cessors, SoCs and KZ Z,ZK lel and distributed a tion networks, and of efficient and scala	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possible plethora of param MI-PAP.16 The students gain MI-PCM.16 MI-PDP.16 Due to the develop are becoming ubic and environments for the students of the many control of the students of the develop are becoming ubic and environments for the students of the students o	potimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems	Z,ZK sary to solve these e can find a commonitially in this (small me preprocessing on method. We will essumably) does not schemes. Z,ZK cessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scala	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 applications languages able parallel
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possible plethora of param MI-PAP.16 The students gain MI-PCM.16 MI-PDP.16 Due to the develop are becoming ubic and environments for the students learn the	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures The a good overview of present parallel architectures and processors: parallel (ILP) microarchitectures, multithreaded and multicore processors, and neural processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems notion of business process logic and its formalization, with business process roles, business rules, and data processing, with the notion	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does no en schemes. Z,ZK cessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scala	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company,
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possible plethora of parameter) of the interest of parameter	potimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does not a schemes. Z,ZK cessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scalar Z,ZK n of service oriente ty and adaptivity and	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company, ind using of
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possible plethora of parameter) of the interest of parameter	optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prevailled algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prevailled algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prevailled algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prevailled algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prevailled algorithm design methods of present parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of perf	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does not a schemes. Z,ZK cessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scalar Z,ZK n of service oriente ty and adaptivity and	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company, ind using of
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possible plethora of parameter) of the interest of parameter	potimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures In a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parallely autious. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems notion of business process logic and its formalization, with business process roles, business rules, and data processing, with the notion and service solution of business logic. They get acquainted with these notions also for the other types o	Z,ZK sary to solve these e can find a commontially in this (small me preprocessing on method. We will essumably) does not a schemes. Z,ZK cessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scalar Z,ZK n of service oriente ty and adaptivity and	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company, ind using of
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possiplethora of parameter) of the interest of the interest of the interest of the students gain interest of the students gain interest of the develop are becoming ubic and environments of the interprise service artificial intelligence in MI-POA.16	potimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems notion of business process logic and its formalization, with business process roles, business rules, and data processing, with the notion is and service solution of business logic. They get acquainted with these notions also for the other types of ISs. They learn about agilitic methods for implementa	Z,ZK sary to solve these e can find a commonitially in this (small me preprocessing on method. We will esumably) does no n schemes. Z,ZK sessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scala Z,ZK n of service oriente ty and adaptivity ans ss processes, busin Z,ZK	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company, ind using of ness rules,
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possiplethora of parameter) of the interest of the interest of the interest of the students gain interest of the students gain interest of the develop are becoming ubic and environments of the interprise service artificial intelligence in MI-POA.16	poptimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solutio eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (pre will also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems Advanced Information Systems and service solution of business logic. They get acquainted with these notions also for the other types of ISs. They learn about again the methods for implementation of these ideas in ISs.	Z,ZK sary to solve these e can find a commonitially in this (small me preprocessing on method. We will esumably) does no n schemes. Z,ZK sessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scala Z,ZK n of service oriente ty and adaptivity ans ss processes, busin Z,ZK	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company, ind using of ness rules,
MI-PAM There are many of exactly in practice (parameter) of the it and polynomially in which is not possiplethora of parameter) of the interest of the interest of the interest of the students gain interest of the students gain interest of the develop are becoming ubic and environments of the interprise service artificial intelligence in MI-POA.16	potimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponent in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution eterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (prewill also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation. Parallel Computer Architectures a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Parallel and Distributed Programming ment of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parall quitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnector parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of algorithms and methods of performance evaluation of their implementations. Advanced Information Systems notion of business process logic and its formalization, with business process roles, business rules, and data processing, with the notion is and service solution of business logic. They get acquainted with these notions also for the other types of ISs. They learn about agilitic methods for implementa	Z,ZK sary to solve these e can find a commonitially in this (small me preprocessing on method. We will esumably) does no n schemes. Z,ZK sessors, SoCs and KZ Z,ZK del and distributed a tion networks, and of efficient and scala Z,ZK n of service oriente ty and adaptivity ans ss processes, busin Z,ZK	4 problems in property parameter of the input, present a t exist. We 5 MPSoCs, 3 5 applications languages able parallel 5 d company, ind using of ness rules, 5

MI-PRC	Programming in CUDA	Z,ZK	4
	students gain a good overview of present parallel architectures in GPUs. Students also get hands-on experience with programming		
MI-PSL	Programming in Scala	Z,ZK	4
	uces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language feature		_
advance standard li	brary. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks and Scalaz, etc.	l libraries e.g. Play,	, Cassandra,
MI-PVR	Advanced Virtual Reality	KZ	4
	ces advanced parts of the virtual reality. It is a continuation of the already running graphic objects, especially the creation of 3D model		1 -
	students to their application in virtual reality. Lectures will focus on virtual reality technology, its use in various applications and will also		_
_	ines (mainly Unity3D). The course is freely connected with the subject VHS (virtual game worlds), students will be able to apply the kn	_	
ŭ	in virtual reality, or directly create a complex game for VR.	0 0	,
MI-PVS	Advanced embedded systems	Z,ZK	4
	sed on ARM processors and microcontrollers and their usage in wide range of applications. The course includes a series of advance		
	storage devices, motor control, system control and industrial communication. The students obtain both theoretical and also practical	•	
working with made	systems.	oxpononece war	omboadoa
MI-PYT	·	V7	4
	Advanced Python	KZ	1
-	urse is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Python		
very nands-on and	it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral coursework	i ne course is lead	d by external
	teachers from Red Hat.		
MI-REV.16	Reverse Engineering	Z,ZK	5
_	quainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens before		
	will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is dedica	•	
	ten in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be do	•	_
debuggers and de	bugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer	malware scene. T	he focus of
	the course is on the seminars, where students will solve practically oriented tasks from the real world.		1
MI-ROZ.16	Pattern Recognition	Z,ZK	5
The aim of the m	odule is to give a systematic account of the major topics in pattern recognition with emphasis on problems and applications of the st	atistical approach	to pattern
recognition. Stu	dents will learn the fundamental concepts and methods of pattern recognition, including probability models, parameter estimation, ar	nd their numerical	aspects.
MI-RRI	Risk Management in Informatics	ZK	3
	y is very often considered as one of main objectives to secure targets of information processing. However, to focus on this info secur	ity as a matter of p	protection of
	viruses, malware etc. very often means misunderstanding and underestimating of real threats which are around us and which are mo	-	
	e necessity to continue with business after disaster is also slightly ignored. International standards which are focused on informatics	-	
	started to anticipate necessity of risk management. There is no commonly accepted methodology used for this task. Threats which a		
	Idwide, invoke pressures to prepare plans for business continuity management even in the case of dramatic political changes, natura		
MI-RUB	Programming in Ruby	KZ	4
WII TOD	· ·	114	-
	This course is presented in Czech.		
MI-DI INI 16	This course is presented in Czech.	7 7K	5
MI-RUN.16	Runtime Systems	Z,ZK	5
	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming language.	uages.	1
MI-SCE2	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II	uages. Z	4
MI-SCE2 The Seminar of Cor	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II nputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	uages. Z o failures and attac	4 ks. Students
MI-SCE2 The Seminar of Corare approached in	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Inputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the	uages. Z o failures and attac subject is work wi	4 ks. Students ith scientific
MI-SCE2 The Seminar of Corare approached in	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher.	uages. Z o failures and attac subject is work wi	4 ks. Students ith scientific
MI-SCE2 The Seminar of Cor are approached in articles and other p	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester.	uages. Z Difailures and attact subject is work wires. The topics are referenced.	4 ks. Students ith scientific new for each
MI-SCE2 The Seminar of Cor are approached in articles and other p	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business	uages. Z p failures and attac subject is work wires. The topics are r	4 ks. Students ith scientific new for each
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of	uages. Z p failures and attac subject is work wires. The topics are reconstruction of the control of the cont	4 eks. Students ith scientific new for each 4 sity to the
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students chess. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about difference in the course introduced in the course individual countries and key regions of world economy. Students get to know about difference in the course introduced in the course in the course introduced in the course in the	uages. Z of failures and attac subject is work wires. The topics are reconstruction of the control of the con	4 ks. Students ith scientific new for each 4 sity to the d cultures,
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester in the program of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for	uages. Z p failures and attac subject is work wires. The topics are reconstruction of the control of the control of the right investment of the right investment.	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision.
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course	uages. Z failures and attac subject is work wires. The topics are reconstruction of the control of the contro	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite.
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester in the program of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for	uages. Z p failures and attac subject is work wires. The topics are reconstruction of the control of the control of the right investment of the right investment.	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision.
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course	uages. Z of failures and attact subject is work wites. The topics are reconstruction Z,ZK of technical universe ferent religions and the right investment BIE-SEP as a preceded.	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security Jain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tra	uages. Z failures and attac subject is work wi s. The topics are r Z,ZK If technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and duffic. The course fo	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The bouses on
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security Network Security Network Secu	uages. Z failures and attac subject is work wi s. The topics are r Z,ZK If technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and duffic. The course fo	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The bouses on
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusioness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security Jain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tra	uages. Z failures and attac subject is work wi s. The topics are r Z,ZK If technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and duffic. The course fo	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The bouses on
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher seminar teacher seminary in the	uages. Z failures and attac subject is work wi s. The topics are r Z,ZK If technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and duffic. The course fo	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The bouses on
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. Network Security and deconomy. Students get to know about differ the program in the seminar teacher seminary in the s	uages. Z ofailures and attact subject is work with the religions and the right investment of the righ	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The couses on g detected
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II Inputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusions in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security Network Security Network Security	uages. Z ofailures and attact subject is work with the religions and the right investment of the righ	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The couses on g detected
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II muture Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of business in diverse societies as well as indexes of economic freedom, corruption and economy. Students get to know about difful business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general processed in the grading the usage of basic tools for the design and simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verilog & Legisla Circuits (VHDL, knowledge about advanced tools System Verilog & Legisla Circuits (VHDL, knowledge about advanced tools System Verilog & Legisla Circuits (VHDL, knowledge about advanced tools System Verilog & Legisla Circuits (VHDL, knowledge about advanced tools Sy	uages. Z of failures and attact subject is work with the subject is work with the subject is work with the right investment of the right investment o	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The ocuses on g detected 5 o get some
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II muture Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of pushiness in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically aborated pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general pricipals in the course of paint in the design and simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verilog & Lamp; System C. Strategic Management of Informatics	uages. Z ofailures and attact subject is work with the religions and the right investment of the righ	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The cuses on g detected 5 o get some
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II muture Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students oness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusions in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about a process of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general process of various mechanisms of securing network infrastructure and detection in real time. The course covers general process of security events (i.e. incident handling and incident response). Digital Circuit Simulation Strategic Management of Informatics set on the strategic management of information systems. Students will learn the process of creation and implementation of an information of the process of creation and implementation of an information.	uages. Z ofailures and attact subject is work with the right investment of the right investment in the right	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance,
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming langer Computer Engineering Seminar Master II Imputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of world economy. Students get to know about difference of the seminar teacher seminar	uages. Z ofailures and attact subject is work with the right investment of the right investment in the right in the	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The ocuses on g detected 5 o get some 5 overnance, f economic
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II muture Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students oness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusions in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about a process of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general process of various mechanisms of securing network infrastructure and detection in real time. The course covers general process of security events (i.e. incident handling and incident response). Digital Circuit Simulation Strategic Management of Informatics set on the strategic management of information systems. Students will learn the process of creation and implementation of an information of the process of creation and implementation of an information.	uages. Z ofailures and attact subject is work with the right investment of the right investment in the right in the	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. Network Security as in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security and theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about a particular to the security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transcical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general prescriptions of security events (i.e. incident handling and incident response). Digital Circuit Simulation Digital	uages. Z ofailures and attact subject is work with the right investment of	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The ocuses on g detected 5 o get some 5 overnance, f economic e part of the
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of seminary by comparing individual countries and key regions of world economy. Students get to know about diffy business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about a process of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transcribed in real time. The course covers general process of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transcribed in the area of current security threats in computer networks, specifically about a security events (i.e. incident handling and incident response). Digital Circuit Simulation Digital Circuit Simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verilog & Lamp; System C. Strategic Management of Informatics so on the strategic management of information systems. Students w	uages. Z ofailures and attact subject is work with street. The topics are referent religions and the right investment of the right investment. The course for incipals of handling. Z,ZK ut detection and defice. The course for incipals of handling. Z,ZK Verilog). They also a course for incipals of handling. Z,ZK verilog). They also a course for incipals of handling. Z,ZK verilog). They also a course for incipals of handling. Z,ZK verilog). They also a course for incipals of handling.	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II muter Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teachers are sented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teachers are sented in Czech. However, there is an English variant in the group and normatics (N1801 / 4793). The course introduces students of the seminar teachers are sented in Czech. However, there is an English variant in the group and program Informatics (N1801 / 4793). The course introduces students of the seminar teachers are sented in Czech. However, there is an English variant in the group and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teachers are sented in Czech. However, there is an English variant in the group and English variant in the group	uages. Z ofailures and attact subject is work with street. The topics are referent religions and the right investment of the right investment. The course for incipals of handling. Z,ZK User detection and description of the right investment. The course for incipals of handling. Z,ZK User detection and description. The course for incipals of handling. Z,ZK User incipals of the reas of the reason	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically aboratic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transactical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general precurity events (i.e. incident handling and incident response). Digital Circuit Simulation Digital Circuit Simulation Strategic Management of Informatics Strategic Management of Informatics Strategic Management of Informatics Strategic Management of Informatics Systems on Chip However Alexander of Systems of Chip However Alexander of Systems of Chip However Alexander of Systems on Chip However Alexander of Systems of Chip However Alexander of	uages. Z ofailures and attact subject is work with street. The topics are referent religions and the right investment of the right investment. The course for incipals of handling. Z,ZK User detection and description of the right investment. The course for incipals of handling. Z,ZK User detection and description. The course for incipals of handling. Z,ZK User incipals of the reas of the reason	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will gourse explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II muter Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students or ness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diffusion in the program informatics (N1801 / 4793). The course introduces students or improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about a process of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transcribus examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general process of security events (i.e. incident handling and incident response). Digital Circuit Simulation Digital Circuit Simulation Formation regarding the usage of basic tools for the design and simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verilog & Digital Circuits (VHDL, knowledge about advanced tools System Verilog & Digital Circuits (VHDL, knowledge and skills in the design of large-scale digital systems. They will be familiar with ar	uages. Z ofailures and attact subject is work with street. The topics are referent religions and the right investment of the right investment. The course for incipals of handling. Z,ZK Verilog). They also the right investment religions and do affic. The course for incipals of handling. Z,ZK Verilog). They also the right investment religions and do affic. The course for incipals of handling. Z,ZK Verilog). They also the right religions are reason of the reason of the right religions are religions. They also the right religions are religions and the right religions are religions. They also the right religions are religions and religions are religions. The religions are religions and religions are religions and religions are religions. The religions are religions. The religions are religions. The religions are relig	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They iffication and
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of eness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diff it business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security uain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general prescriptions of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general prescription regarding the usage of basic tools for the design and simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verlog & Departmen	uages. Z ofailures and attact subject is work with technical universifierent religions and the right investment of the right	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The ocuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They iffication and
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher seminar teacher seminar teacher seminary teacher seminar	uages. Z ofailures and attac subject is work wi s. The topics are r Z,ZK of technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and do offic. The course fo incipals of handling Z,ZK Verilog). They also Z,ZK ution strategy, IT go dge in the areas of o, CEO, CFO). The Z,ZK cation among their large systems ver Z,ZK els, knowledge rep	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They iffication and
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of the seminar teacher is a seminar teacher of the seminar teacher of the seminar teacher is a seminar teacher of the	uages. Z ofailures and attac subject is work wi s. The topics are r Z,ZK of technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and do offic. The course fo incipals of handling Z,ZK Verilog). They also Z,ZK ution strategy, IT go dge in the areas of o, CEO, CFO). The Z,ZK cation among their large systems ver Z,ZK els, knowledge rep	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They iffication and
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students or semest. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diff of business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general procurity is security events (i.e. incident handling and incident response). Digital Circuit Simulation Formation regarding the usage of basic tools for the design and simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verilog & Empt. System. Strategic Management of Informatics sets on the strategic management of information systems. Students will learn the process of creation and imple	uages. Z ofailures and attac subject is work wi s. The topics are r Z,ZK of technical univers ferent religions and the right investme BIE-SEP as a pre Z,ZK ut detection and do offic. The course fo incipals of handling Z,ZK Verilog). They also Z,ZK ution strategy, IT go dge in the areas of o, CEO, CFO). The Z,ZK cation among their large systems ver Z,ZK els, knowledge rep c web, including its	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The ocuses on g detected 5 o get some 5 overnance, f economic e part of the fr parts. They diffication and 5 oresentation, s standards
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will gourse explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rotessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of passiness and individual countries and key regions of world economy. Students get to know about did judicines and individes societies as well as indexes of economic freedom, corruption and economic development, which are needed to be improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically abo basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transcrictal examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general precedure in the area of current security threats in computer networks, specifically abo basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network transcrictal examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general precedure in the course of the design of large-tased and flow-based analysis, in order to detect anomalies and suspicious network tr	uages. Z of ailures and attact subject is work with the result in the right investment of the right i	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The occuses on g detected 5 o get some 5 overnance, f economic e part of the 5 r parts. They iffication and 5 oresentation, s standards
MI-SCE2 The Seminar of Cor are approached in articles and other p MI-SEP This course is p international busin necessary for doing Seminars help to MI-SIB.16 The students will g course explains explanation and p MI-SIM.16 Students gain info MI-SMI.16 The course focuse the importance of management of IS MI-SOC.16 Students gain key k will use an appropri MI-SWE.16 Students learn star and practical aspe	Runtime Systems Student become familiar - theoretically and practically - with runtime systems and virtual machines for various programming lang Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the rofessional literature and/or work in K. N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher semester. World Economy and Business resented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students or semest. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about diff of business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security pain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically about basic pricipals of security monitoring, packet-based and flow-based analysis, in order to detect anomalies and suspicious network tractical examples of various mechanisms of securing network infrastructure and detection in real time. The course covers general procurity is security events (i.e. incident handling and incident response). Digital Circuit Simulation Formation regarding the usage of basic tools for the design and simulation of VLSI (very large scale integration) digital circuits (VHDL, knowledge about advanced tools System Verilog & Empt. System. Strategic Management of Informatics sets on the strategic management of information systems. Students will learn the process of creation and imple	uages. Z of failures and attact subject is work with standard process. The topics are referent religions and the right investment of the right invest	4 ks. Students ith scientific new for each 4 sity to the d cultures, ent decision. erequisite. 5 efense. The ocuses on g detected 5 o get some 5 overnance, f economic e part of the 7 fresentation, s standards 5 em, together

learn the basics of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM) based solutions. They will also learn the principles of securing websites, web applications and databases. Upon completion of the module, students will have a broad overview of IT security and will be able to apply it to the integration of various software systems and applications. MI-SYP.16 Parsing and Compilers The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of various variants and applications of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. MI-SZ1 Knowledge Engineering Seminar Master I 7 On this seminar you will present a research paper from a top institute / research group to your peers. You will learn what is being cooked in top research labs around the world. Additionally, you will learn how to properly present and read scientific papers. The work in the seminar will prepare you to attend (and profit from) top machine learning and Al conferences and summer schools, as well as FIT's own Summer Research Program (VyLet). MI-TES.16 Systems Theory Today, humankind has the ability to develop systems of incredible complexity (e.g., trains, microprocessors, airplanes, nuclear power plants). However, the costs of managing this complexity and of ensuring the correct behavior of a given system have become critical. A key technique for mastering this complexity is the usage of models that describe only those aspects of the systems that are important for the task at hand, and automated tools for analyzing those models. This subject will present theory and algorithms that form the basis for the modeling and analysis of complex systems. MI-TNN Theory of Neural Networks Z,ZK 4 In this course, we study neural networks from the point of view of the theory of function approximation and from the point of view of probability theory. At first, we recall basic concepts pertaining to artificial neural Networks, such as neurons and connections between them, types of neurons from the point of view of signal transmission, network topology, somatic and synaptic mappings, network training, and the role of time in neural networks. In connection with network topology, we get acquainted with its transformation into a canonical topology, and in connection with somatic and synaptic mappings, with their composition into mappings computed by the Network, Finally in connection with training, we pay attention to the problem of overtraining and to the fact that training is actually a specific optimization task, recalling the most typical objective functions and the most important optimization methods employed for neural network training. We will see the meaninig of all these concepts in the context of common kinds of forward neural networks. Within the topic approximation approach to neural networks, we first notice the connection of neural networks to expressing functions of many variables using functions of fewer variables (Kolmogorov theorem, Vituškin theorem). Afterwards, we will see how the universal approximation capacity of neural networks can be mathematically formalized as the sets of mappings computed by neural networks being dense in important Banach spaces of functions, in particular in the spaces of continuous functions, spaces of functions integrable with respect to a finite measure, spaces of functions with continuous derivatives, and Sobolev spaces. Within the topic probabilistic approach, we first get acquainted with training based on expectation and training based on a random sample, and with probabilistic assumptions about training data with which those two kinds of neural networks can be employed. We will see how it is possible to get an estimate of the conditional expectancy of network outputs conditioned by its inputs using the expectancy based learning. We recall the strong and the weak law of large numbers and get acquainted with an analogy of the strong law of large numbers for neural networks and with the assumptions for its validity. Finally, we recall the central limit theorem, get acquinted with its analogy for neural networks, with the assumptions for its validity and with the hypothesis tests based on it. We will see how those tests can be employed to search for the topology of the network. MI-TS1 Theoretical Seminar Master I 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. MI-TS2 Theoretical Seminar Master 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. MI-TS3 Theoretical Seminar Master III 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. MI-TS4 Theoretical Seminar Master IV Z 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. MI-TSP.16 Testing and Reliability Z,ZK Students gain knowledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to prepare a test set with the help of the intuitive path sensitization and to use an ATPG for automatic test generation. They will be able to design easy testable circuits and systems with built-in-self-test equipment. They will be able to analyze and control reliability and availability of the designed circuits. MI-VEM Scientific thinking K7 2 The objective of the course is to get acquainted with scientific methods and discovery of order and laws of the universe, including the aspects of human life. The subject combines scientific methods in natural sciences, mathematics, computer science and humanities. Another aim is to introduce rules and requirements of scientific communication via research papers and posters Selected statistical methods 8 Summary of probability theory; Multivariate normal distribution; Entropy and its application to coding; Statistical tests: T-tests, goodness of fit tests, independence test; Random processes - stacionarity; Markov chains and limiting properties; Queuing theory MI-VYC Z,ZK 4 Computability Classical theory of recursive functions and effective computability, with applications in provability theory. MI-W20.16 Z.ZK 5 Web 2.0 Students will learn new trends and technologies on the Web including theoretical foundations. Students will gain an overview about Web applications architectures, concepts and technologies about programmable Web (REST Architectures, Mashups), basic mechanisms for knowledge representation on the Web (microformats, meta-data, ontologies, open linked data, etc.), mechanisms about collective intelligence (collaborative filtering, predictions of users' behaviours), social networks, and security. MI-ZS10 Master internship abroad for 10 credits 10 Each student can once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institution. Before the internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the internship. Auxiliary courses MI-ZS10, MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks of full-time employment with a foreign institution. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects if the internship exceeds the academic year's dead-line.

MI-ZS20	M. J. J. J. J. D. J. J. D. J. J. J. D. J. J. J. J. D. J.		
Fach student can	Master internship abroad for 20 credits	Z	20
	once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institut		
	the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and ex MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks		
	on. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects i		
a 1010.g.1 1110.t.t.	academic year's dead-line.	. tire interrient p ex	
MI-ZS30	Master internship abroad for 30 credits	Z	30
	once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institut		
	the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and ex		-
courses MI-ZS10,	MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in IS KOS. Every 10 credits correspond to 4 weeks	of full-time emplo	oyment with
a foreign instituti	on. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects i	f the internship ex	ceeds the
	academic year's dead-line.		1
NI-ADM	Data Mining Algorithms	Z,ZK	5
	s on algorithms used in the fields of machine learning and data mining. However, this is not an introductory course, and the students s		-
pasics. The empha	sis is put on advanced algorithms (e.g., gradient boosting) and non-basic kinds of machine learning tasks (e.g., recommendation systems of the delay	ems) and models	(e.g., kerne
NII ADD	methods).	7 71/	
NI-ADP	Architecture and Design patterns	Z,ZK	5
-	is course is to provide students with both work knowledge about the underlying foundations of object-oriented design and analysis as ues, and tradeoffs of advanced software design. In the first part of the course, the students will refresh and deepen their knowledge of		_
-	n the commonly used object-oriented design patterns that represent the best practices for solving common software design problems. In		_
•	the principles of software architecture design and analysis. This includes the classical architectural styles, component based systems,	•	
	architectures used in large-scale distributed systems.		
NI-AIB	Algorithms of Information Security	Z,ZK	5
Students will get a	equainted with the algorithms of secure key generation and cryptographic error (not only biometric) data processing. Furthermore, studen		nathematica
principles of cry	otographic protocols (identification, authentication, and signature schemes). Another part of the course is dedicated to malware detect	ion and the use of	f machine
	learning in detection systems. The last topic includes practical steganographic methods and attacks on steganographic system	ns.	
NI-AM1	Middleware Architectures 1	Z,ZK	5
	dy new trends, concepts, and technologies in the area of service-oriented architectures. The will gain an overview of information syste		
architecture and ap	lication servers. The will also study principles and technologies for middleware focused on application integrations, asynchronous commi	unications and hig	h availabilit
	of applications.		
NI-AM2	Middleware Architectures 2	Z,ZK	5
Students will learn	new trends and technologies on the Web including theoretical foundations. They will gain an overview of Web application architecture	s, concepts and to	echnologies
	for microservices, distrubuted cache and databases, smart contracts, realtime communication and web security.		
NI-AML	Advanced machine learning	Z,ZK	5
	ces students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field of recreation and interesponding to the supplier in the field of machine learning. The size of the supplier in the familiar in a students with the	-	_
	control and interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the		5
NI-APR	Selected Methods for Program Analysis studies program behavior with the aim of code optimization and error detection. Students will learn static program analysis, which app	Z,ZK	_
	to actually run the program, as well as dynamic program analysis which analyse programs at runtime. Students will be introduced to t		
	algorithms and use them on some classical problems.		
NI-BKO	Error Control Codes	Z,ZK	5
	il of the course is to present various ways to detect or correct individual errors and burst errors in data stored into memories or transm	•	-
NI-BML	Bayesian Methods for Machine Learning	KZ	5
	sed on practical use of basic Bayesian modeling methods in the dynamically evolving machine learning theory. In particular, it studies the		I
-	description of real phenomena, as well as their subsequent use, e.g., for forecasting of future evolution or learning about the hidden v		
rom noisy observa	tions etc.). The emphasis is put on understanding of explained principles and methods and their practical adoption. For this purpose, a n	umber of real wor	ld example:
and applications	will be presented to students, for instance, 2D/3D object tracking, radiation source term estimation, or separation in medical imaging.	The students will t	ry to solve
	some of them.		ı
	Business Informatics	Z,ZK	5
NI-BUI	se is to focus on operational, tactical and strategic management of business informatics. Students will gain knowledge in the areas of bu	•	•
he aim of the cou	architectures in enterprise informatics. They will also learn about the principles, models and standards (ITIL, COBIT) in IT managemer		•
he aim of the cou ICT services and			OT ICLI TOP
The aim of the cou ICT services and of ICT services a	nd resource management (sourcing). Students will learn the process of creating and implementing information strategy, IT Governance assertion of information strategy, IT Governance assertion of information strategy with alpha I business strategy. They will also gain leaveled as in the process of assertion IT management	-	
The aim of the cou ICT services and of ICT services a	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management	-	
The aim of the could ICT services and of ICT services a business and the	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT managemer management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO).	nt, revenue and in	vestment
The aim of the could ICT services and of ICT services a business and the NI-BVS	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security	z,ZK	vestment 5
The aim of the country of ICT services and of ICT services a business and the NI-BVS Students gain basi	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptography.	Z,ZK graphic primitives	vestment 5 in hardware
The aim of the cou CT services and of ICT services a business and the NI-BVS students gain basi	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptography systems). Students gain a good overview of functionality of (hardware) cryptographic accelerators, smart cards, and resources	Z,ZK graphic primitives	vestment 5 in hardware
The aim of the councT services and of ICT services and of ICT services and the services are services and the services and the services are services and the services and the services are services as the services are services and the services are services and the services are services and the services are services as the services are services as the services are services as the services are services and the services are services as the services are services are services as the services are services are services are services as the services are services as the services are services are services are services as the services are services are	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT managemer management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptography and systems). Students gain a good overview of functionality of (hardware) cryptographic accelerators, smart cards, and resources of computer systems.	Z,ZK graphic primitives for securing interr	5 in hardward
The aim of the could Total Services and of ICT services a business and the NI-BVS Students gain basing software (in en NI-CCC	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT managemer management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptography and cryptanalysis. Students gain a good overview of functionality of (hardware) cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art	Z,ZK graphic primitives for securing interr	5 in hardware nal functions
The aim of the could ICT services and of ICT services and the services and software (in end). The services and software (in end).	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the business of the course freely follows the course freely follows the co	Z,ZK graphic primitives for securing interr KZ pasic graphics cou	5 in hardware nal functions 4
The aim of the could To services and of ICT services and of ICT services a business and the NI-BVS Students gain basing and software (in en NI-CCC Students work on BLE,) and introduced in the services of	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT managemer management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptography and cryptanalysis. Students gain a good overview of functionality of (hardware) cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic met	syestment 5 in hardware nal functions 4 urses (MGA thods using
The aim of the could ICT services and of ICT services and of ICT services a business and the NI-BVS Students gain basing and software (in email of the NI-CCC Students work on BLE,) and introduced in ICT in the service of the services o	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographed systems). Students gain a good overview of functionality of (hardware) cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the bluces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic met	syestment 5 in hardware nal functions 4 urses (MGA thods using
The aim of the could ICT services and of ICT services and the services and software (in end of the services of the services and software (in end of the services of the services and software (in end of the services of the services and software (in end of the services	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the bluces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique es. The aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture and M	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic met	5 in hardware hal functions 4 4 urses (MGA thods using
The aim of the could ICT services and of ICT services and of ICT services a business and the NI-BVS Students gain basing and software (in ending ICCC) Students work on particular services and introduced in technology.	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT managemer management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the bluces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique es. The aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture and Months) (Institute of Intermedia FEL). Diploma Project	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic meletropolitan Planni	systement 5 in hardware nal functions 4 urses (MGA thods using ing) and IIIN
The aim of the could ICT services and of ICT services and of ICT services a business and the NI-BVS Students gain basing and software (in ending ICC Students work on BLE,) and introduced in the ICC Students work on ICC Students work on ICC Students work on ICC Students work on ICC ICC Students work on ICC ICC ICC ICC ICC ICC ICC ICC ICC IC	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the bluces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique es. The aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture and Monthstitute of Intermedia FEL). Diploma Project Game Design	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic meteropolitan Planni Z Z,ZK	systement 5 in hardware hal functions 4 urses (MGA thods using ing) and IIIV 30 5
The aim of the could ICT services and of ICT services and of ICT services a business and the NI-BVS Students gain basing and software (in en NI-CCC Students work on particular services) and introduced in technolog NI-DIP NI-DPH The course completes and software the services of the services and services are services and services are services and services and services and services and services and services and services are services and services and services and services	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT managemer management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the bluces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique es. The aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture and Months) (Institute of Intermedia FEL). Diploma Project	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic metaletropolitan Planni Z Z,ZK esign. It is intende	5 in hardware nal functions 4 urses (MGA thods using ing) and IIIV 30 5 d for people
The aim of the could The aim of the could The aim of the could The aim of ICT services and of ICT services are business and the NI-BVS Students gain basis and software (in en NI-CCC Students work on particular technolog NI-DIP NI-DPH The course compleinterested in deep ICT services and ICT serv	e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT management management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO). Embedded Security c knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptographic accelerators, smart cards, and resources of computer systems. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the fluces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique es. The aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture and Month (Institute of Intermedia FEL). Diploma Project Game Design ments the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game described in the propert of the	Z,ZK graphic primitives for securing interr KZ pasic graphics cousts with artistic meteropolitan Planni Z Z,ZK esign. It is intende	systement 5 in hardware hal functions 4 urses (MGA thods using ing) and IIIv 30 5 d for people and game

NI-DSS **Decision Support Systems** Z,ZK 5 The aim of the course is to provide students with knowledge and skills in decision support systems, their classification (Powerova), selected principles of data-oriented, model-oriented and knowledge-oriented decision support systems. Students will also gain knowledge of multicriterial decision-making methods and game theory. They will also learn about the principles of conceptually and ontologically oriented decision support systems and the basics of distribution, optimization and evolution methods and algorithms. NI-EHW **Embedded Hardware** Z,ZK 5 The course brings basic laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the base of advanced embedded systems, that profit from their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed, including standardized means of internal communication, parallelism extraction and utilization in special structures and system architectures. NI-EPC Effective C++ programming Z,ZK Students learn how to use the modern features of contemporary versions of the C++ programming language for software development. The course focuses on programming effectivity and efficiency in the form of writing maintainable and portable source code and creating correct programs with low memory and processor time requirements NI-FSW Embedded Software Embedded software course acquainted students with the specifics of software development for embedded systems. The course covers the areas from the basic techniques of programming in C language and code optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, up to sophisticated techniques combined with artificial intelligence. NI-FMT Finite model theory 7.7K The aim of the course is to introduce students to the basics of finite model theory. The original motivation is the questions expressibility and verifiability of logical properties of database systems. Since its inception in the 1970s, the course has evolved rapidly and touched on many other areas of theoretical computer science, such as descriptive complexity theory, the Constraint Satisfaction Problem (CSP), the theory of algorithmic meta-theorems and combinatorics. Graph Neural Networks NI-GNN Z.ZK 4 The course introduces students to advanced artificial intelligence techniques for working with graphs. Lectures will focus on the latest graph neural networks for creating vector representations of nodes, edges and entire graphs. The techniques discussed cover various types of graphs, including time-varying graphs. The last part of the course also covers graph generation and interpretability of graph neural networks. In the exercises, students will try out selected techniques and problems. NI-GPU GPU Architectures and Programming Z,ZK 5 Students will gain knowledge of the internal architecture of modern massively parallel GPU processors. They will learn to program them mainly in the CUDA programming environment, which is already a widespread programming technology of GPU processors. As an integral part of the effective computational use of these hierarchical computational structures, students will also learn optimization programming techniques and methods of programming multiprocessor GPU systems. NI-GRI **Grid Computing** Z,ZK Grid computing and gain knowledge about the world-wide network and computing infrastructure. NI-HCM ZK Mind Hacking 5 Cognitive security is an emerging discipline that is closely related to cyber security. While the domain of cyber security is the protection of networks, information systems and assets, the domain of cognitive security is the protection of the human mind from intentional and unintentional digital manipulation. The topic of cognitive security is growing in importance in the context of information warfare, increasing digital dependence and the development of artificial intelligence, where these phenomena from the Internet environment have real societal impacts such as disruption of social cohesion, threats to democracy or war. NI-IAM 7.7K Internet and Multimedia The NI-IAM course is focused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes acquisition of AV signals (input), presentation of AV signals (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practical use case scenarios of real-time audiovisual transmissions. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the effect of various components on the quality and latency of AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recording the scene up to the presentation for audience. NI-LSM Statistical Modelling Lab ΚZ The subject is oriented on a single and multi-target tracking. The student both learns the existing methods and tries to implement them. The stress is put on the effective use of the available information and its modeling using numpy and scipy. The second half of the semester is focused on the design of methods and algorithms, and analyses of their properties. At this point, the subject is on the border of own research and may result in the topic of final work (diploma or bachelor thesis). ΚZ NI-LSM2 Statistical Modelling Lab 5 The topic of LSM2 is advanced multiple target tracking (MTT). This domain covers simultaneous tracking of multiple targets using radar under the presence of clutter, or video tracking. We aim at the state-of-the-art filters, in particular the PHD (Probability Hypothesis Density) and PMBM (Poisson Multi-Bernoulli) filters NI-MCC Multicore CPU Computing Students will get acquainted in detail with hardware support and programming technologies for the creation of parallel multithreaded computations on multicore processors with shared and virtually shared memories, which are today the most common computing nodes of powerful (super)computer systems. Students will gain knowledge of architecturally specific optimization techniques used to reduce the performance drop due to the widening gap between the computational requirements of multi-core CPUs and memory interface throughput. On specific non-trivial multithreaded programs, students will also learn the basics of the art of creating these applications. Machine Learning in Practice Applying machine learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ideally, technical implementation The course guides students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically. The aim is to experience real data processing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and understandable report. Modern Object-Oriented Programming in Pharo Object-oriented programming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where its ability to natural abstraction is used to build complex 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 implementation of object systems in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development needs and areas of interest. In addition to deepening object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work on interesting projects and OO technologies in terms of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvement in the Pharo Consortium. Modelling of Programming Languages The analysis, transformation, and code generation processes depend on the semantics of the language; in particular, they are correct if they preserve the semantics of the language. This course explores the semantics of programming languages. The students will learn the language models with emphasis on functional languages, students are expected to understand the basics of the lambda calculus and here get acquainted with the advanced lambda calculus. The students also get hands-on-experience with semantic modeling and execution tools. NI-MTI Modern Internet Technologies Z.ZK SYNOPSIS The subject "Modern Internet Technologies" is designed on four major pillars of networking: 1. Unified Communication and Collaboration - A single network, oriented on TCP/IP is able to carry whatever types of protocols for whatever purposes. This architecture is able to be protocol independent and carries voice, video and data to achieve seamless integrated services. 2. Design of Extremely Scalable Networks - This provides the insights of network architectures which can accommodate hundreds of millions of users and billions of devices. Thus, there is a paradigm switch from LANs (Local Area Networks) to SPs (Service Providers). 3. Traffic Segregation, Traffic Matching and Traffic Prioritisation - These

technologies allow service providers to create private channels of communication between customers, with guaranteed parameters (bandwidth, delay, jitter, type of protocol). 4. Acceleration Technologies - They allow traffic to be carried at the optimal speed and allow for graceful degradation of service parameters in case of failures. NI-MVI Computational Intelligence Methods Z.ZK 5 Students will understand methods and techniques of computational intelligence that are mostly nature-inspired, parallel by nature, and applicable to many problems. They will learn how these methods work and how to apply them to problems related to data mining, control, intelligen games, optimizations, etc. **NI-NUR** User Interface Design Students will understand the theorical background of human-computer interaction and user interface (UI) design, will learn formal description of UIs, formal user models, the fundamental notions and procesures. They get acquainted with graphical, speech, and multimodal Uls. Thanks to the gained knowledge, the students will be able to design advanced Uls. Operating Systems and Systems Programming Z.ZK NI-OSY The course covers system programming in UNIX environment. Emphasis is given on kernel development with focus on kernel architecture and kernel data structures. Key topics are: process management, memory management, file operations and architecture of modern file systems, device drivers and network programming. The course also addresses kernel development process, upgrades of existing kernels, kernel booting, debugging using dynamic instrumentation, and techniques to guarantee portability. Specifics of kernel architecture in embedded and real-time operating systems are also discussed. Theoretical and general principles are demonstrated on the LINUX kernel. Within labs, students will work on projects focused on development of LINUX kernel modules. NI-PAS Advanced Aspects of Business Z,ZK 4 The aim of the course is to provide students with advanced (compared to the bachelor's degree) knowledge and skills needed to establish and run their own business or business management, especially in law, administration (necessary steps and documents), business economics, foreign trade and related aspects NI-PDB Advanced Database Systems 5 Students orient themselves in problems of evaluation and optimization of SQL queries. The next part of the course deals with new concepts of database machines (so called NoSQL databases), with the related new data models (XML, graph databases, column databases) and languages for working with them (XQuery, XPath, CYPHER, Gremlin). The last part of the course deals with performance evaluation of database machines. NI-PDD **Data Preprocessing** Z,ZK 5 Students learn to prepare raw data for further processing and analysis. They learn what algorithms can be used to extract information from various data sources, such as images, texts, time series, etc., and learn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction of characteristics from images or from web pages. NI-PG1 Computer Grafics 1 7K The course builds on graphic courses (mainly BI-PGA and BI-PGR) and the knowledge from these courses is deepened by state-of-the-art knowledge. The course is designed for those interested in advanced computer graphics. Students will gain practical knowledge with realistic texturing and raytracing methods. An integral part of the course is the study of scientific articles and their subsequent implementation. The course will be followed by a course PG2 supplementing the knowledge of PG1 on other areas and topics of computer graphics. NI-PSD Public Services Design The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective of suppliers (devs and designesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration with client representatives. Course is aimed at students-designers as well as clients. NI-SBF System Security and Forensics Students will get familiar with aspects of system security (principles of end station security, principles of security policies, security models, authentication concepts). Furthermore, students will get familiar with forensic analysis as a tool for investigating security incidents (techniques used by malicious software/attackers and forensic analysis techniques and the importance of operating system/operating system artifacts or file system for attack analysis and detection). Parsing and Compilers 5 The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of various variants and applications of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. NI-TNN Theory of Neural Networks Z,ZK In this course, we study neural networks from the point of view of the theory of function approximation and from the point of view of probability theory. At first, we recall basic concepts pertaining to artificial neural Networks, such as neurons and connections between them, types of neurons from the point of view of signal transmission, network topology, somatic and synaptic mappings, network training, and the role of time in neural networks. In connection with network topology, we get acquainted with its transformation into a canonical topology, and in connection with somatic and synaptic mappings, with their composition into mappings computed by the Network, Finally in connection with training, we pay attention to the problem of overtraining and to the fact that training is actually a specific optimization task, recalling the most typical objective functions and the most important optimization methods employed for neural network training. We will see the meaninig of all these concepts in the context of common kinds of forward neural networks. Within the topic approximation approach to neural networks, we first notice the connection of neural networks to expressing functions of many variables using functions of fewer variables (Kolmogorov theorem, Vituškin theorem). Afterwards, we will see how the universal approximation capacity of neural networks can be mathematically formalized as the sets of mappings computed by neural networks being dense in important Banach spaces of functions, in particular in the spaces of continuous functions, spaces of functions integrable with respect to a finite measure, spaces of functions with continuous derivatives, and Sobolev spaces. Within the topic probabilistic approach, we first get acquainted with training based on expectation and training based on a random sample, and with probabilistic assumptions about training data with which those two kinds of neural networks can be employed. We will see how it is possible to get an estimate of the conditional expectancy of network outputs conditioned by its inputs using the expectancy based learning. We recall the strong and the weak law of large numbers and get acquainted with an analogy of the strong law of large numbers for neural networks and with the assumptions for its validity. Finally, we recall the central limit theorem, get acquinted with its analogy for neural networks, with the assumptions for its validity and with the hypothesis tests based on it. We will see how those tests can be employed to search for the topology of the network. NI-TSW Software Product Development ΚZ 4 The course is presented in Czech. NI-VCC Z.ZK Virtualization and Cloud Computing 5 Students will gain knowledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and organizations. They will get acquainted with virtualization principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficiently operate and optimize the performance parameters of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective technology today for the management of complex computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skills in the use of modern integration and development tools (Continuous integration and development). NI-VMM Retrieval from Multimedia Z,ZK 5 The student obtains general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature extraction from multimedia objects, indexing, and structure of distributed search engines. NI-VPR Ζ 5 Research Project Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.

NIE-PDL	Practical Deep Learning	KZ	5				
This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machine learning framework. Throughout							
the course, student	the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields such as computer vision and natural						
	language processing.						
NIE-PML	Personalized Machine Learning	Z,ZK	5				
Personalized mad	hine learning (PML) is a sub-field of machine learning that aims to create models and predictions based on the unique characteristic	s and behaviors of	individual				
entities. While PML	is commonly used in applications such as recommender systems, which recommend items to users based on their personal interest	s, its principles car	n be applied				
to a wide range of o	ther fields, including education, medicine, and chemical engineering. In this course, we will explore the latest PML methods from theore	tical, algorithmic, a	and practical				
	perspectives. Specifically, we will focus on cutting-edge models that are of interest to both the research and commercial commu	nities.					
PI-SCN	Seminars on Digital Design	ZK	4				
This subject deals	with problems of realization and implementation of digital circuits - both combinational and sequential. Basic means of description of	digital circuits and	basic logic				
synthesis and o	ptimization algorithms are described. Basics of EDA (Electronic Design Automation) systems are given, together with combinatorial p	problems emerging	in EDA.				

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2024-05-18, time 20:23.