### Study plan

# Name of study plan: Master specialization System Programming, in Czech, version from 2023

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: 98

Elective courses credits: 22 Sum of credits in the plan: 120

Note on the plan: Garant: doc. Ing. Jan Janoušek, Ph.D., email: jan.janousek@fit.cvut.cz

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 63

Master Project

The role of the block: PP

Code of the group: NI-PP.2020

Name of the group: Compulsory Courses of Master Study Program, Version 2020, in Czech

Requirement credits in the group: In this group you have to gain 63 credits

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

Credits in the group: 63 Note on the group:

NI-MPR

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-DIP	<b>Diploma Thesis</b> Zden k Muziká <b>Zden k Muziká</b> Zden k Muziká (Gar.)	Z	30	270ZP	L,Z	PP
NI-KOP	Combinatorial Optimization Jan Schmidt, Ji í Vysko il, Petr Fišer Jan Schmidt Jan Schmidt (Gar.)	Z,ZK	6	2P+2C	Z	PP
NI-MPR	Master Project Zden k Muziká	Z	7		Z,L	PP
NI-MPI	Mathematics for Informatics Št pán Starosta, Jan Sp vák Št pán Starosta Št pán Starosta (Gar.)	Z,ZK	7	3P+2C	Z	PP
NI-PDP	Parallel and Distributed Programming Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	6	2P+2C	L	PP
NI-VSM	Selected statistical Methods Petr Novák, Daniel Vašata, Ivo Petr, Pavel Hrabák, Jitka Hrabáková, Jana Vacková Pavel Hrabák Pavel Hrabák (Gar.)	Z,ZK	7	4P+2C	L	PP

# Characteristics of the courses of this group of Study Plan: Code=NI-PP.2020 Name=Compulsory Courses of Master Study Program, Version 2020, in Czech

NI-DIP	Diploma Thesis	Z	30				
NI-KOP	Combinatorial Optimization	Z,ZK	6				
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 evaluate	also to apply and evaluate heuristics for practical problems.						

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. The external supervisor enters the information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut.cz/student/studijni/formulare). The completed and signed form must be delivered in person or by email to the SZZ coordinator, who will arrange for the credit to be granted. 3. If the 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.

NI-MPI Mathematics for Informatics Z,ZK 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.

Parallel and Distributed Programming NI-PDP

21st century in computer architectures is primarily influenced by the shift of the Moore's law into parallelization of CPUs at the level of computing cores. Parallel computing systems are becoming a ubiquitous commodity and parallel programming becomes the basic paradigm of development of efficient applications for these platforms. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnection networks and collective communication operations, and languages and environments for parallel programming of shared and distributed memory computers. They get acquianted with fundamental parallel algorithms and on selected problems, they will learn the techniques of design of efficient and scalable parallel algorithms and methods of performance evaluation of their implementations. The course includes a semester project of practical programming in OpenMP and MPI for solving a particular nontrivial problem.

NI-VSM Selected statistical Methods

Z,ZK

5

The course leads the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multivariate normal distribution, application of entropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with random processes with focus on Markov chains. The high point of the course is the Queuing theory and its application in networks.

Name of the block: Compulsory courses in the specialization

Minimal number of credits of the block: 35

The role of the block: PS

Code of the group: NI-PS-SP.23

Name of the group: Compulsory Courses of Master Specialization System Programming, v.2023, in Czech

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.

NI-APT

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
NI-EPC	Effective C++ programming Daniel Langr Daniel Langr (Gar.)	Z,ZK	5	2P+1C	Z	PS
NI-GEN	Code Generators Petr Máj Petr Máj Jan Janoušek (Gar.)	Z,ZK	5	2P+1C	Z	PS
NI-OSY	Operating Systems and Systems Programming Petr Zemánek, Tomáš Martinec Petr Zemánek Petr Zemánek (Gar.)	Z,ZK	5	2P+1C	Z	PS
NI-APT	Advanced Program Testing Pierre Donat-Bouillud Pierre Donat-Bouillud (Gar.)	Z,ZK	5	2P+1C	Z	PS
NI-RUN	Runtime Systems Filip K ikava Filip K ikava Filip K ikava (Gar.)	Z,ZK	5	2P+1C	L	PS
NI-SYP	Parsing and Compilers  Jan Janoušek Jan Janoušek (Gar.)	Z,ZK	5	2P+1C	Z	PS
NI-APR	Selected Methods for Program Analysis Filip K ikava Filip K ikava Filip K ikava (Gar.)	Z,ZK	5	2P+1C	Z	PS

#### Characteristics of the courses of this group of Study Plan: Code=NI-PS-SP.23 Name=Compulsory Courses of Master Specialization System Programming, v.2023, in Czech

NI-EPC	Effective C++ programming	Z,ZK	5			
Students learn how to u	se the modern features of contemporary versions of the C++ programming language for software development. The course fo	ocuses on progra	mming effectivity			
and efficiency in the form of writing maintainable and portable source code and creating correct programs with low memory and processor time requirements.						

Code Generators Advanced techniques of translating programs written in high-level programming languages are essential for understanding the field of systems programming. This primarily involves understanding the algorithms and techniques used to translate more complex programming constructs of modern languages employed in systems programming. Students will become

familiar with both the theoretical and practical aspects of implementing the back-end of optimizing compilers for programming languages. 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.

Testing a program is essential to ensure that a program respects its specification, that changes do not introduce regressions or security issues. The goal of the course is to present advanced program testing techniques, beyond writing unit tests, especially fuzzing and symbolic execution.

NI-RUN Runtime Systems Z,ZK

This course is an introduction to the world of virtual machines (VM) for high-level programming languages. There are two goals: Give you hands-on experience in design and implementation of a compiler and a VM from scratch, including Abstract Syntax Tree (AST) interpretation Byte code (BC) design and interpretation AST to BC compilation Memory management Just-in-time compilation and some optimization techniques Through a series of guest lectures, introduce you to various advanced topics and implementations of real-world VMs, including Dynamic optimizations, speculations, and deoptimizations Language implementation frameworks Read-world VMs

NI-SYP Parsing and Compilers Z,ZK 5 The module builds upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of various variants and applications

of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.

Advanced Program Testing

NI-APR Selected Methods for Program Analysis

This course introduces you to program analysis, i.e., the automated reasoning about the behavior of a computer program. We will cover static and dynamic analysis. In Static Analysis, we will look at the art of reasoning about computer programs without running them. We will look at the analyses for program understanding, optimizations, error detection. In Dynamic Analysis, we will look at the analyses considering individual program runs using a concrete environment and inputs.

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.2021

Name of the group: Purely Elective Master Courses

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	e re-comple	ted.			
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-AOA	Completing a professional event	Z	1			V
NI-ATH	AlgorithmicTheories of Games Tomáš Valla Tomáš Valla (Gar.)	Z,ZK	4	2P+2C	L	V
NI-AFP	Applied Functional Programming Marek Suchánek, Robert Pergl, Daniel N mec Robert Pergl Robert Pergl (Gar.)	KZ	5	2P+1C	L	V
NI-APH	Architecture of computer games  Adam Vesecký	Z,ZK	4	2P+1C	Z	V
NI-VGA	Video Games Architecture  Jan Matoušek, Radek Richtr Jan Matoušek Radek Richtr (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-BPS	Wireless Computer Networks Ji í Kašpar, Alexandru Moucha Alexandru Moucha (Gar.)	Z,ZK	4	2P+1C	L	V
NI-BSO	Biosignals and Biomedical Image Processing Vanda Benešová Vanda Benešová (Gar.)	Z,ZK	5	2P+2C		V
NIE-BLO	Blockchain  Jakub R ži ka, Josef Gattermayer, Marek Bielik Josef Gattermayer Josef  Gattermayer (Gar.)	Z,ZK	5	1P+2C	z	V
NI-CTF	Capture The Flag Ji í Dostál, Jakub Barto , Vojt ch Novák, Ladislav Marko <b>Ji í Dostál</b> Ji í Dostál (Gar.)	KZ	4	3C	Z,L	V
NI-CAP	Cultural and Social Anthropology Alena Libánská, Tomáš Houdek, Jakub Šenovský Alena Libánská Alena Libánská (Gar.)	ZK	2	2P	Z	V
NI-DPH	Game Design Adam Vesecký	Z,ZK	5	2P+1C	L	V
NI-DSW	Design Sprint Ond ej Brém, Michal Manda Michal Manda David Pešek (Gar.)	Z	2	30B	Z	V
NI-PSD	Public Services Design Ond ej Brém, David Pešek, Jan Ladin David Pešek Ond ej Brém (Gar.)	KZ	4	1P+2C		V
NI-DID	Digital drawing Denisa Nová ková Denisa Nová ková (Gar.)	Z	2	4C	Z,L	V
NI-DZO	Digital Image Processing	Z,ZK	4	2P+1C	L	V
NI-DDM	Distributed Data Mining Tomáš Borovi ka	KZ	4	3C	L	V
NI-PAM	Efficient Preprocessing and Parameterized Algorithms Ond ej Suchý Ond ej Suchý (Gar.)	Z,ZK	4	2P+1C	L	V
NI-ESC	Experimental Project Course  Jan Matousek, Ond ej Brém Ond ej Brém (Gar.)	KZ	8	OP+30R+52C	L	V
NI-GLR	Games and reinforcement learning  Juan Pablo Maldonado Lopez	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 Pavel Tvrdík 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
NI-HSC	Side-Channel Analysis in Hardware Petr Socha, Vojt ch Miškovský Petr Socha Vojt ch Miškovský (Gar.)	Z,ZK	4	2P+2C	Z	V

NI-HMI2	History of Mathematics and Informatics  Alena Šolcová Alena Šolcová Alena Šolcová (Gar.)	ZK	3	2P+1C	Z	V
NI-IBE	Information Security Igor ermák	ZK	2	2P	Z	V
NI-IVS	Intelligent embedded systems Miroslav Skrbek Miroslav Skrbek (Gar.)	KZ	4	1P+3C	L	V
NI-IKM	Internet and Classification Methods  Martin Hole a Martin Hole a Martin Hole a (Gar.)	Z,ZK	4	1P+1C	L	V
NI-IAM	Internet and Multimedia	Z,ZK	4	2P+1C	L	V
NI-IOT	Internet of Things Jan Jane ek	Z,ZK	4	2P+1C	L	V
FITE-EHD	Introduction to European Economic History Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)	Z,ZK	3	2P+1C	L	V
NI-KTH	Combinatorial Theories of Games Tomáš Valla Tomáš Valla (Gar.)	Z,ZK	4	2P+1C	L	V
NI-FMT	Finite model theory	Z,ZK	4	2P+1C	L	V
NI-CCC	Creative Coding and Computational Art Ond ej Brém, Radek Richtr, Ji í Sebele, Josef Kortan Josef Kortan Radek Richtr (Gar.)	KZ	4	1P+2C	Z,L	V
NI-KYB	Cybernality	ZK	5	2P	Z	V
NI-LSM2	Statistical Modelling Lab Kamil Dedecius Kamil Dedecius (Gar.)	KZ	5	3C	Z,L	V
NI-LOM	Linear Optimization and Methods Dušan Knop Dušan Knop (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-MPL	Managerial Psychology Jan Fiala Jan Fiala (Gar.)	ZK	2	2P	Z,L	V
NI-MSI	Mathematical Structures in Computer Science  Jan Starý	Z,ZK	4	2P+1C	L	V
NI-MZI	Mathematics for data science Št pán Starosta	Z,ZK	4	2P+1C	L	V
FIT-ITI	Modern IT infrastructure  Jan Fesl, Ivan Šime ek, Tomáš Vondra Ivan Šime ek Ivan Šime ek (Gar.)	Z,ZK	5	2P+1C	Z,L	V
NI-MOP	Modern Object-Oriented Programming in Pharo  Jan Blizni enko Robert Pergl Robert Pergl (Gar.)	KZ	4	3C	Z	V
NI-MMA	Multiplatform development of mobile applications Rostislav Babá ek, Jakub Olejník, Igor Rosocha Martin P Ipitel Martin P Ipitel (Gar.)	KZ	4	2P+2C	L	V
NI-NLM	Neural Language Models	Z	5	2P+1C	L	V
NI-NMS	Neural Networks, Machine Learning and Randomness  Martin Hole a Martin Hole a Martin Hole a (Gar.)	Z,ZK	4	1P+1C	Z	V
NI-NMU	New media in art and design Zden k Svejkovský Zden k Svejkovský (Gar.)	ZK	3	2P+0C	Z	V
NI-OLI	Linux Drivers Jaroslav Borecký, Miroslav Skrbek Jaroslav Borecký Miroslav Skrbek (Gar.)	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
NI-ARI	Computer arithmetic Pavel Kubalik Pavel Kubalik (Gar.)	Z,ZK	4	2P+1C	Z,L	V
NI-PG1	Computer Grafics 1 Radek Richtr Radek Richtr (Gar.)	ZK	4	2P+1C	L	V
NI-PIV	Computer Vision Radek Richtr, Vanda Benešová, Šimon Šmída Radek Richtr Vanda Benešová (Gar.)	Z,ZK	5	2P+2C	Z	V
NI-EDW	Enterprise Data Warehouse Systems Jakub Krej í, Robert Kotlá <b>Jakub Krej í</b> Magda Friedjungová (Gar.)	Z,ZK	5	1P+1C	L	V
NI-PVR	Advanced Virtual Reality Petr Pauš Petr Pauš Petr Pauš (Gar.)	KZ	4	2P+1C	Z	V
NI-AML	Advanced machine learning Zden k Buk, Miroslav epek, Rodrigo Augusto Da Silva Alves, Petr Šimánek, Vojt ch Rybá <b>Miroslav epek</b> Miroslav epek (Gar.)	Z,ZK	5	2P + 1C	L	V
NI-IOS	Advanced techniques in iOS applications  Martin P Ipitel	KZ	4	2P+2C	L	V
NI-APT	Advanced Program Testing Pierre Donat-Bouillud Pierre Donat-Bouillud (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-PVS	Advanced embedded systems  Miroslav Skrbek	Z,ZK	4	2P+2C	Z	V
NI-DNP	Advanced .NET David Šenký , Nikolas Jíša David Šenký David Šenký (Gar.)	Z,ZK	4	2P+1C	L	V
NI-PYT	Advanced Python  Miroslav Hron ok	KZ	4	3C	Z	V
NIE-PDL	Practical Deep Learning  Martin Barus, Yauhen Babakhin Karel Klouda Karel Klouda (Gar.)	KZ	5	2P+1C	Z	V
FIT-ACM1	Programming Practices 1 Tomás Valla Tomás Valla (Gar.)	KZ	5	4C	L	V

	I Book and the Boo		I			
FIT-ACM2	Programming Practices 2 Tomáš Valla Ond ej Suchý (Gar.)	KZ	5	4C	Z	V
FIT-ACM3	Programming Practices 3 Ond ej Suchý Ond ej Suchý (Gar.)	KZ	5	4C	L	V
FIT-ACM4	Programming Practices 4 Ond ej Suchý Ond ej Suchý (Gar.)	KZ	5	4C	Z	V
FIT-ACM5	Programming Practices 5 Ond ej Suchý Ond ej Suchý (Gar.)	KZ	5	4C	L	V
FIT-ACM6	Programming Practices 6 Ond ej Suchý Ond ej Suchý (Gar.)	KZ	5	4C	L	٧
NI-GOL	Programming of distributed systems in GO  Jaroslav K íž, Róbert Selvek <b>Jaroslav K íž</b> Jaroslav K íž (Gar.)	KZ	5	0P+3C	Z	V
NI-PSL	Programming in Scala Ji i Dan ek	Z,ZK	4	2P+1C	Z	V
NI-RUB	Programming in Ruby Cyril erný Cyril erný (Gar.)	KZ	4	3C	Z	V
NI-ROZ	Pattern Recognition Michal Haindl Michal Haindl (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-PLS4	Programming Language Seminar Filip K ikava, Pierre Donat-Bouillud Pierre Donat-Bouillud Pierre Donat-Bouillud (Gar.)	Z	2	0P+1C	L	V
NI-PLS3	Programming Language Seminar Pierre Donat-Bouillud	Z	2	0P+1C	Z	V
NI-PLS2	Programming Language Seminar Filip K ikava, Pierre Donat-Bouillud Pierre Donat-Bouillud Pierre Donat-Bouillud (Gar.)	Z	2	0P+1C	L	V
NI-PLS1	Programming Language Seminar Filip K ikava, Pierre Donat-Bouillud Pierre Donat-Bouillud Pierre Donat-Bouillud (Gar.)	Z	2	0P+1C	Z	V
NI-SCE1	Computer Engineering Seminar Master I Hana Kubátová Miroslav Skrbek Hana Kubátová (Gar.)	Z	4	2C	L,Z	V
NI-SCE2	Computer Engineering Seminar Master II Hana Kubátová Hana Kubátová (Gar.)	Z	4	2C	L,Z	V
NI-SZ1	Knowledge Engineering Seminar Master I Pavel Kordík Magda Friedjungová (Gar.)	Z	4	2C	L,Z	V
NI-SZ2	Knowledge Engineering Seminar Master II Pavel Kordík Magda Friedjungová (Gar.)	Z	4	2C	L,Z	V
PI-SCN	Seminars on Digital Design Petr Fišer Petr Fišer (Gar.)	ZK	4	2P+1C	Z,L	V
NI-MLP	Machine Learning in Practice Jan Hu in Daniel Vašata Daniel Vašata (Gar.)	Z,ZK	5	2P+1C	Z	V
FIT-SEP	World Economy and Business Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)	Z,ZK	4	2P+2C	L	V
NI-SEP	World Economy and Business Tomáš Evan Tomáš Evan Tomáš Evan (Gar.)	Z,ZK	4	2P+1C	Z,L	V
NI-TVR	Virtual Reality Technology Tomáš Nová ek Tomáš Nová ek Tomáš Nová ek (Gar.)	Z,ZK	3	1P+1C	L,Z	V
NI-TS1	Theoretical Seminar Master I  Dušan Knop, Ond ej Suchý, Tomáš Valla, Michal Opler Tomáš Valla Tomáš  Valla (Gar.)	Z	4	2C	Z	V
NI-TS2	Theoretical Seminar Master II Ond ej Suchý, Tomáš Valla Tomáš Valla Tomáš Valla (Gar.)	Z	4	2C	L	V
NI-TS3	Theoretical Seminar Master III Tomáš Valla	Z	4	2C	Z	V
NI-TS4	Theoretical Seminar Master IV Ond ej Suchý, Tomáš Valla Tomáš Valla Ond ej Suchý (Gar.)	Z	4	2C	L	V
NI-TKA	Category Theory Jan Starý Jan Starý (Gar.)	Z,ZK	4	2P+1C	L	V
NI-TNN.25	Theory of Neural Networks Martin Hole a Martin Hole a (Gar.)	Z,ZK	4	1P+1C	L	V
NI-TNN	Theory of Neural Networks  Martin Hole a	Z,ZK	5	2P+1C	L	V
NI-CPX	Complexity Theory Ond ej Suchý Dušan Knop Ond ej Suchý (Gar.)	Z,ZK	5	3P+1C	Z	V
FIT-TOP	Academic writing Tomáš Nová ek, Petr Kroha Tomáš Nová ek Tomáš Nová ek (Gar.)	Z	2	10B	Z	V
NI-DVG	Introduction to Discrete and Computational Geometry Maria Saumell Mendiola Maria Saumell Mendiola (Gar.)	Z,ZK	5	2P+1C	L	V
NI-LNG	Introduction to Linguistics for IT Students Václav Cvr ek Václav Cvr ek (Gar.)	ZK	2	2P	L	V
NI-VEM	Scientific thinking Petr Klán, Tomáš Houdek, Helena Štorchová Petr Klán Petr Klán (Gar.)	KZ	2	1P+1C	L	V
NI-VOL	Elections Dušan Knop Dušan Knop Dušan Knop (Gar.)	Z,ZK	5	2P+1C	L	V
NI-VYC	Computability Jan Starý Jan Starý (Gar.)	Z,ZK	4	2P+2C	L	V

NN-2510	NI-VPR	Research Project Št pán Starosta Št pán Starosta Št pán Starosta (Gar.)	Z	5	Z	,L	V
Ni-ZS20   Master internship abroad for 20 credits   Z   20   Z,L   V   Ni-ZS30   Master internship abroad for 30 credits   Z   30   Z,L   V    Characteristics of the courses of this group of Study Plant. Code-Ni-V2021 Name-Purely Elective Master Courses  Ni-ZS30   Advanced Program Testing   Z,Z   S    Testing a pragam is essential to estudy a foreign manual program of the second of the secon	NI-ZS10	Master internship abroad for 10 credits	Z	10	Z	,L	V
Ni-ASSO  Master internship abroad for 30 credibls  Zeden & Musibility Zeden & Musibility (2004)  Responsibility (2	NI-ZS20	Master internship abroad for 20 credits	Z	20	Z	,L	V
Characteristics of the courses of this group of Study Plan: Code-NI-V.2021 Name-Purely Elective Master Courses  NI-APT  Advanced Program Testing  Ad	NI-ZS30	Master internship abroad for 30 credits	Z	30	Z	,L	V
NAPT		, ,					
Tearing a program is essential to ensure that a program inspects its specification, that changes do not introduce agressions or security issues. The goal of the course is to presentationed or program of the course is to presentation of control to the course is to presentation of the course is to present the course is to present the course is to present the course in the vice decident to the course in the course is to present the course in the vice decident to the course of the course is the course in the course is to present the course in the vice decident to the course of the course is the course in the course in the course is the vice decident to the course in the course is the vice decident to the course is the vice decident to the course is the vice decident to the course is the part of the course in the course is the vice decident to the course is the part of the course is the p			=Purely Electi	ve Master (		<del></del>	
activated program testing techniques, beyond writing unit testis, especially fuzzing and symbolic execution.  N.A.T.  The subject is participation in a one-off professional event, usually a lecture by a foreign guest of the FIT CTU. concluded with a workshop, a test, defining a report. Such as new manus to approved in advance by the visco-date for pedingogical activities or the visco-date for science and research and is presented within the FIT through a workshot. Informal, at MIN-ATT.  Algorithmic Theories of Games  Tradicional guern behavior by a branch of maternatics, which has broad applications in economy, biology, politics and computer science. This theory studies the testiscing forms the visco-grant of the participation is propertied to the guern where the behavior of agents (playurs) of a curtain compositive process by designing a mathematical model and investigating the strategies. The tradicional tiss of classical game theory is to fine designed which are the states of agent series from his strategy, but to the recent development of computers, interest, social interest, on the audition which are the states of agent series from his strategy, but to the recent development of computers of efficient composition of the concepts the algorithm price in the behavior of agents in the course in presented in Country to term document to the course of the removable of the country and the form the course of the removable of the country and the form that the course is a minute of the country of the co			regressions or sec	ourity issues. Th		rea is to	-
NHAGA  Completing a professional event to subject to participation in a one off professional event usage) a fortune by a foreign guest of the FIT CTU, concluded with a workshop, a test, drifting a persper, esc Such an even must be approved in advance by the vice-deen for pedagogical activities or the vice-dean for scalence and research and a presented within the FIT through a weeksion, inclination of the National Application in a design and processing and the scale of passed grants and through a weeksion, in the FIT through as weeksion, inclination of the provision of the perspective of the passed			e regressions or sec	unity issues. H	ne goal of the co	11 SC 15 II	present
The subject is participation in a one-dil professional event, usually a lecture by a foreign quest of the FIT CTU, concluded with a workshop, a state, affirming a report, etc. Such an extra ten approved in advance by the vent-cent for pedispagated activities or the vent-cent for sealing-cent and advances by the vent-cent for pedispagated activities or the vent-cent foreign and advances of the vent-cent foreign and advances or the cent foreign					7		1
Invast be approved in advance by the vice-dean for postagogical activities or the vice-dean for science and research and is presented within the FIT through a velocite, formal with a Traditional game theory is a barnch of mathematics, which has broad applications in economy, biology, politics and computer science. This theory studies the behaviour of agents (highways) of a certific competitive process by designing an antermanistic mode and investigating the startage. The teaching tasks of classical memory, so intermed the competitive process by designing an antermanistic mode and investigating the startage. The teaching tasks of classical entworks, online auctions, advantage and the states of the game where no player vanies to design from his startage, Due to the recent development of computers, internet, social networks, online auctions, advantage and the states of the game where no player vanies to design from this startage. Due to the recent development of computers, internet, social networks, online auctions, advantaged to the computer of the state of		, , , , , , , , , , , , , , , , , , , ,	concluded with a wo	orkshop a test	_	etc Su	•
NI-ATH Algorithmic Theories of Games Traditioning immer theory is a branch of mathematics, which has broad applications in economy, biology, politics and computer science. This theory studes the behaviour of a depending (players) of a certain competitive process by designing an arthermatical model and investigating the strategies. The traditional task of datasets game theory is to first the equilibrium which are the states of the game where no player wants to devise from his strategy. Due to the recent development of computers, internet, social networks, online auctors, advertise multisages are not other concepts the algorithmic point of view is gaining attention. In addition to existential questions we study the problems of efficient computation.  NI-AFP   Applied Functional Programming presents one of the traditional programming paradigms. Traditional and motivate of programming paradigms are the rise newadays and the functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming paradigms are the rise newadays and the functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming paradigms are the rise newadays and the functional programming represents one of the traditional programming paradigms. Traditional and novel functional programming paradigm becomes an important construct of traditionally imperative languages (C++, C+a, Java). As such, mastering this paradigm becomes an important construct of traditionally imperative languages (C++, C+a, Java). As such, mastering this paradigm becomes an important construction of the traditional programming paradigm becomes an accessary operation of the virture is seaso in the field of computer gaines development, especially from a technical point of view, to be alternative. They will get a garge of component-oriented and functional-oriented architecture, game mechanics, occision—making programming paradigm becomes an accessary operation of the				• • • • • • • • • • • • • • • • • • • •			
Traditional game theory is a transh of mathematics, which has broad applications in economy, biology, pollice and computer science. This theory studies the behaviour of appeals (players) of a certain competitive process by designing an anterimentation does and mestigating the states of the game where no player wants to devise from his states p. Due to the recent development of computers, internet, social networks, online autitions, advertised to the control of the computers of views paints and extended of their computations of views paints and the control of view to play the process of the control of the computation of views paints and the control of views and the control of view			•			Ť	
(pisyees) of a certain competitive process by designing a mathematical model and investigating the strategies. The traditional tasks of cassessal game theory is to find the equilibric which are the states or the game where no player wants to devise from his strategy. Due to the record trived recipient, internet, social networks, online automos, advertism multiagent systems and other concepts the algorithmic point of view is gaining attention. In addition to existential questions we study the problems of efficient computation of various discidence nonestics. In this course we introduce the beasts of game theory of many pisyers, autolian concepts, the his course we introduce the beasts of game theory of many pisyers, autolian concepts, the problems of efficient computation.  NI-APP Applied Functional Programming persents one of the traditional programming paradigms. Traditional and nonel functional programming internet the rise newadays and the functional programming negating in the programming persents the internet or according to the programming paradigm becomes received the rise of the programming persents of the programming persents of the rise of the programming persents of the progra		1 9	and computer scien	ce This theory		l aviour of	•
which are the states of the game where no player wants to deviate from his strategy. Due to the recent development of computers, internet, social networks, online auctions, advertise multipage in yearnes and other concepts the algorithmic point of view is gaining attention. In addition to existential questions we study the protection of efficient computation of views social pages and pages and the formation of the development of views. Social pages and the formation of the computation of views are provided in the basics of game theory of many players, solution concept (tassally equilibrity) and methods of their computation.  NHAFP   Applied Expectional Programming parameters and the functional programming parameters and parameters and the functional programming parameters and parameters and the functional programming parameters and paramete	-	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	-			-
multiagent systems and other concepts the alignminitro point of view is gaining attention. In addition to existential questions we study the problems of efficient computation of vario solution concepts. In this course we introduce the basics of game theory of many players, solution concepts (susually equilibring) and methods of their computations. In this course is presented in Czech. Functional Programming progresses on one of the traditional programming paradigms, Traditional and novel functional programming paradigm becomes measured to the control of traditionally imperative languages are the functional programming paradigm becomes measured to the control of traditionally imperative languages (C++, Ce, Java), As such, mastering this paradigm becomes recessary completion of a software engineer: the theory and especially the practice.  NI-APH   Architecture of computer games Sudentially the practice of the control of the				_	=		-
solution concepts. In this course we introduce the basics of game theory of many players, solution concept (assually equilibria) and methods of their computation.  NASP Applied Excel. Functional programming This course is presented in Czech. Functional programming represents one of the traditional programming paragings. Traditional and revent functional programming increases and the reincread paragine processes in important construct of traditionally imperative languages (C++, C#, Java), As such, mastering this paradigm becomes mention and the functional paragine processes in important construct of traditionally imperative languages (C++, C#, Java), As such, mastering this paradigm becomes mentionally and the functional programming and paragine processes and base components that form a nature of the various issues in the field of computer games development, especially from a technical point of view, but also from design and philosophe perspective. They will get a grasp of component-oriented and functional architecture, game mechanics, decision-making processes and base components that form an international of a simple game, with a strong tools on nontrivial game mechanics.  NI-VGA  IVIGEO Games Architecture  The course covers a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design and publicosphical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, compared and functional architecture typic game development, physics, graphica, artificial intelligence and multipoles. The exercises will then cover selected technological topics in greater detail, including ways of implement solutions, in the form of practical demonstrations.  NI-BPS  Wireless Computer Networks  Suddents will learn about the modern technologics, procedures and architecture six and subject to the coverage and analysis of biological signals and medical image processing.  NI-BPS  Bi			=				_
N-AFF   Applied Functional Programming in sources is presented in Czech Fuctional programming presents on on the traditional programming paradigms. Traditional and novel functional programming insurance are the rise nowadays and the functional prandigm becomes an important construct of traditionally imperative languages (C++, C#, Javn). As such, mastering this paradigm becomes necessary competence of a software engineer the thereon, and especially the practice.  NI-APH   Architecture of computer games   Z, ZK   A Speciment will gain a basic or design and programming and especially the practice.  NI-APH   Architecture of computer games   Z, ZK   A Speciment will gain a basic or group of the several programming of the programming of the programming of the course is a management of the programming of the programming of the course is a management of the programming of the programming of the course is a management of the programming of the course is a management of the course is a simple game, with a storage focus on morthlying game inchements.  NI-VGA   Video Games Architecture   Video Games of Video Games							
This course is presented in Czech. Functional programming languages are the fine nowadays and the functional paradigm becomes an important contracture of traditional pringmanning languages are the fine nowadays and the functional paradigm becomes an important contracture of traditional pringmanning languages are the fine nowadays and the functional paradigm becomes necessary competence of a software engineer the theory and especially the practice.  NI-NPH Architecture of computer games Sudants will gain a basic understanding of the various issues in the field of computer games development, especially from a technical point of view, but also from design and philosoph perspective. They will get a grapp of component-oriented and functional-oriented architecture, game mechanics, decision-making growed and base components that from an interpart of most games. They will also understand the basics of pathfinding, networking and scripting and apply them in practical exercises (labs). An important part of the curse is a mightine and the paradic of the properties of the properties.  NI-VGA Video Games Architecture The course covers a vider range of topics, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design a phyliciagnae development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implementation of view. In the lactures, sudered will be guided through the history of development, the structure of game engines, component and functional engines and broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks, multipast at broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanisms to a draw for the control paradic principles and paradical paradical paradical	·		, , ,		<del></del>		5
the rise novowalays and the functional paradigm becomes an important construct of traditionally imperative languages (C++, C#+, Java). As such, mastering this paradigm becomes necessary componence of a software engineer, the theory and especially from a technical point of view, but also from design and pallocation of the processes and to compute games.  N=APH  Architecture of computer games  Fively will gie a passe, or component-oriented and functional-oriented architecture, game mechanics, decision-making processes and base components has form an impart of most games. They will also understand the basics of pathfinding, networking and scripting and apply them in practical exercises (labs). An important part of the course to a simple game, with a strong focus on nontrivial game mechanics.  NI-VGA Video Games Architecture  The course covers a valer range of tooliges, procedures and methodologies related to the development, the structure of game engines, component and functional architecture typic game development, physics, graphics, artificial intelligence and methodologies related to the development, the structure of game engines, component and functional architecture typic game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological typics in greater detail, including ways of implements one game mechanics, in the form of practical demonstrations.  NI-BPS  Wireless Computer Networks  Wireless Computer Networks  Sudents will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-thoe networks, multicast an behavior to wiveless networks understand the routing mechanisms in ad-thoe networks, multicast an behavior of wireless networks and game and provides to provide students will be configuration of wireless network demonstrations in provides students will be configuration of wireless network demonstrations in provides students will be configuration of wireless netwo			diams Traditional a	nd novel functi		a lanau:	-
necessary competence of a software engineer: the theory and especially the practice.  NI-APH Architecture of computer games Sudents will gain a base understanding of the various issues in the feld of computer games development, especially from a technical point of view, but also from design and philosoph perspecture. They will get a graps of component-oriented and functional-oriented architecture, game mechanics, decision-making promotes and base components that from an integer of most games. They will also understand the basics of pathfinding, networking and scripting and apply them in practical exercises (labs). An important part of the course is a implementation of a simple game, with a strong focus on nontrivial game mechanics. Geological profices in the production of the course is a wide range of topics, procedures and nethodological related to the development of computer games - from a technical point of view. In the lactures, students will be guided through the history of development, the structure of game engines, component and functional architecture bytic game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implement some game mechanics, in the form of princical demonstrations.  NI-BPS Wireless Computer Networks Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hore chemistry, multicast an broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanisms to reviews a mechanisms and offset for the provides technics and get all and configuration of wireless networks using suitable to the provides technics and reduction and broadcast mechanisms. And data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security	•		· ·				ū
NI-APH Architecture of computer games Students will gain a basic understanding of the various issues in the field of computer games development, especially from a technical point of view, but altor from design and philosophy perspective. They will get a grasp of component-oriented and functional-oriented architecture, game mechanics, decision-making processes and base components that form an interpart of most games. They will get a grasp of component-oriented and functional-oriented architecture, game mechanics.  NI-VGA Video Games Architecture The course covers a wide range of broise, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design a philosophical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture typics game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implementation of the form of practical demonstrations.  NI-BPS Wirrielsss Computer Networks  Wirrielsss Computer Networks  Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hoc networks, multicast an broadcast menchanisms, and data flow control mechanisms. They will sole learn about principles of communication in sesson networks using suitable tools.  NI-BSO  Biosignals and Biomedical Image Processing  The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image During the course, students will vote on examples of processing various biosignals in the MITAL as deprivation. All processing in the course is to conferent students of the biomedical principles, techniques, and applications related to the processing and analysis of biologic	· · · · · · · · · · · · · · · · · · ·		auges (011, 0#, 0a)	ra). 713 3doi1, 111	lastering this pair	adigiii b	coomes a
Sudents will gain a basic understanding of the various issues in the field of computer garnes development, especially from a sethicital point of view, but also from design and philosopher propertients and the control of the processing and set of the course is a simple garne. Will also understand the basics of pathfinding, networking and scripting and apply them in practical exercises (labs). An important part of the course is a simplementation of a simple game, with a strong focus on nontrivial game mechanics.  NI-VGA Video Games Architecture  The course covers a wade range of topics, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design a probliosophical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture typic game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implement of the processing of the processing of the processing of the processing and processing. In the form of practical demonstrations.  NI-BPS Wireless Computer Networks  Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-thor networks, multicast an broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanism or wireless networks and get skills of configuration of wireless networks and simulation of wireless networks and get skills of configuration of wireless networks and simulation of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical magnes.  NI-BCO Biockchain  Biological Signal Signal Signal Signal Signal Signal Signal Signa					7 7K		1
perspective. They will get a grasp of component-oriented and functional-oriented and surcitional part of most games. They will also understand the basics of pathrifuling, networking and and spript and apply them in practical exercises (labs). An important part of the course is a implementation of a simple game, with a strong focus on nontrivial game mechanics.  NI-VGA   Video Games Architecture   Z, ZK   5.  The course covers a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design a philosophical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture typics are development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implements one game mechanics, in the form of practical demonstrations.  NI-BSD   Wirrless Computer Networks   Z, ZK   4  Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hoc networks, multicast an breadcast mechanisms, and das flow control mechanisms rely will also learn about principles of communication in sensor networks. They get knowledge of security mechanisms relieved to configuration of wireless network elements and simulation of wireless and services and personal of configuration of wireless network elements and simulation of wireless networks and get statics as sudents with whore or examples of processing various biosignals in the MATLAB environment. After completing the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students will vork on examples of processing various biosignals in the MATLAB environment. After completing the course, students bord be able to design a implement solutions to complet			ally from a tochnical	point of vious b	1 '	 an and n	•
part of most games. They will also understand the basics of pathfinding, networking and scripting and apply them in practical exercises (labs). An important part of the course is a simplementation of a simple game, with a strong focus on nontrivial game mechanics.  NI-VGA  Video Games Architecture  The course covers a wide trage of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture typic game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implement of the processing of the processing and processing and the processing and the processing of the processing of the processing and data flow control mechanisms. They will also learn about the mode for origination of writeless networks. They will understand the routing mechanisms in ad-hoc networks, multicast an broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They gat knowledge of security mechanisms for writeless networks and get skilled or configuration of writeless networks using suitable tools.  NI-BSO  Biosignals and Biomedical Image Processing  The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image principles students will work on exemples of processing variety of the processing variety of p	•		•				
implementation of a simple game, with a strong focus on nontrivial game mechanics.  NI-VGA Video Games Architecture  7, ZK 5  The course covers a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design a philosophical point of view, in the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture spice game development, physics, graphics, artificial intelligence and multipleys. The exercises will then cover selected technological topics in greater detail, including ways of implement some game mechanics, in the form of practical demonstrations.  NI-BPS Writeless Computer Networks  Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in a d-hoc networks, multicoast an broadcast mechanisms, and data find two control mechanisms. They will also learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in a d-hoc networks multicoast an obsence of the processing of the course is to provide and two control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanism for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitable tools.  NI-BSD  Silosignals and Biomedical Image Processing  7, ZK					=		_
NI-VGA   Video Games Architecture   Z,ZK   5   The course covers a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture typic game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implements one game mechanisms, in the form of practical demonstrations.  NI-BPS   Wireless Computer Networks   Z,ZK   4   4   Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hoc networks, multicast an broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanism for wireless networks and get skills of configuration of wireless network learness and simulation of wireless networks is using suitable tools.  NI-BSO   Biosignals and Biomedical Image Processing  The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical broad puring the course, students will work on examples of processing value beginning to the course, students should be able to design as implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO   Biockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to design as implement should be able to design and implementation of blockchain in solutions in both academia and business.  NIE-BLO   Biockchain   Biockchain   Biockchain   Biockchain   Biockchain   Biockchain   Biockchain   Biockchain   Bi	-		m m praotical exerc	1000 (1000). 7 111	important part o		100 10 411
The course covers a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view, but also from a design a philosophical point of view, in the lectures, students will be guided through the history of development, the structure of game engines, component and functional architecture typics game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implement some game mechanics, in the form of practical demonstrations.  NI-BPS   Wireless Computer Networks   Vision	•	Tana a sa			7 7K		5
philosophical point of view. In the lectures, students will be quided through the history of development, the structure of game engines, component and functional architecture typics game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implementations.  NI-BPS   Wireless Computer Networks   Care   Ca	_	I .	tor gamas from a	cohnical point		from a c	_
game development, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, including ways of implements ome game mechanics. In the form of practical demonstrations.  NI-BPS   Wireless Computer Networks   Virginary   Virginar			•	•			•
Some game mechanics, in the form of practical demonstrations.  NI-BPS   Wireless Computer Networks   Z,ZK   4  Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hoc networks, multicast an broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanisms for wireless networks and get skills of configuration of wireless networks learned and simulation of wireless networks and get skills of configuration of wireless networks learned and simulation of wireless networks and get skills of configuration of wireless networks learned and simulation of wireless networks using suitable tools.  NIF-BSO   Biosignals and Biomedical Image Processing The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO   Biockchain   Biockchain   Biockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to design a students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to deso doed and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security it is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF   Capture The Flag   KZ   4   1   1   1   1   1   1   1							
NI-BPS   Wireless Computer Networks   Z,ZK   4			a teermological top	ics in greater a	ctail, illoladilig w	ays or in	ipicinicining
Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hoc networks, multicast an broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in research revorks. They get knowledge of security mechanism for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitable tools.  NI-BSO  Biosignals and Biomedical Image Processing  The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image puring the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students should be able to design a implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO  Blockchain  Subschain  Subschain the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to design at microacod and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF  Capture The Flag  NI-CAP  Cultural and Social Anthropology  The necesser course aims to acquaint students to TCF competitions and let them gain practical experience in the field of cyber security.  NI-CAP  Cultural and Social Anthropology  The one-senseter course aims to acquaint students with the basics of social and cultural anthr					7 7K		1
broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanism for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitable tools.  NI-BSO Biosignals and Biomedical Image Processing The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image buring the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students should be able to design a implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO Blockchain Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain process an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain technology, smart contract programming, and gain an overview of most notable blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF Capture The Flag The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP Cultural and Social Anthropology ZK 2  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples of anthropological research from our "exotic"		·	deretand the routing	n mechanisms	1 '	 ke mult	-
In the wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitable tools.  NI-BSO Biosignals and Biomedical Image Processing  The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image  During the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students should be able to design a implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO Blockchain  Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to des code and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF Capture The Flag  The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP Cultural and Social Anthropology  The neon-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples ff anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH Game Design  The course is presented in Czech.  NI-DPH Game Design  Pos		- · · · · · · · · · · · · · · · · · · ·					
NI-BSO   Biosignals and Biomedical Image Processing   Z,ZK   5   The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image During the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students should be able to design a implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO   Blockchain   Z,ZK   5   Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to design and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchain and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-hased solutions in both academia and business.  NI-CTF   Capture The Flag   KZ   4   The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP   Cultural and Social Anthropology   ZK   2   The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples f anthropological research form our 'exotic' cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH   Game Design   Z,ZK   5   The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on gam					inowicage of see	arity inc	citatiisiiis
The aim of the course is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological signals and medical image During the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students should be able to design a implement solutions to complete tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO Blockchain   Students will understrand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain placetorms. They will be able to design at interpret results will understrand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain placetorms. They will be able to design at the provision of the properties of the properties of a properties of a properties of a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF Capture The Flag  The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP  The course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples of the other properties and properties and properties in the properties in the properties is presented in Czech.  NI-DPH  Garne Design  Z,ZK  5  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design, it is intended for per interested in deeper knowledge of the principles used for gam			worke doing callabi	3 10010.	7 7K		
During the course, students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students should be able to design as implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO  Blockhain  Read Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to descode and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship be between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF  Capture The Flag  KZ 4  **The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP  Cultural and Social Anthropology  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples for anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH  Game Design  Fix C,ZK  Z,ZK  Z,ZK  Sudents will work on projects using the Public Scipping and development from the designer's perspective, from theoretical concepts to practical implementation applied to seme projects.  NI-DSW  Design Sprint  Scipping Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. During the course the students will get familiar wi		Biosignais and Biomedical image Processing	he proceeding and	analysis of high	1 '		_
implement solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world medical challenges.  NIE-BLO  Blockchain  Z,ZK  5  Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to descode and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF  Capture The Flag  RZ  4  The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP  Cultural and Social Anthropology  ZK  2  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples of anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH  Game Design  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design, it is intended for per interested in depear knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to seme projects.  NI-DSW  Design Sprint  Z  2  2  3  VI-PSD  Public		a is to provide students with theoretical principles, techniques, and applications related to the				d modic	
NE-BLO Blockchain Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to des code and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF Capture The Flag NI-CAP Cultural and Social Anthropology The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH Game Design The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design,. It is intended for per interested in deper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to seme projects.  NI-DSW Design Sprint  Z 2  Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Dut the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the							
Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to descode and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF    Capture The Flag		udents will work on examples of processing various biosignals in the MATLAB environment	t. After completing t	he course, stu	dents should be		
code and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementation supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF   Capture The Flag   KZ   4  The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP   Cultural and Social Anthropology   ZK   2  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples of anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH   Game Design   Z,ZK   5  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and gam development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to seme projects.  NI-DSW   Design Sprint   Z   2  Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Dut the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing wi	<u> </u>	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn	t. After completing t	he course, stu	dents should be		lesign and
relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF  Capture The Flag  NI-CAP  Cultural and Social Anthropology  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples f anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH  Game Design  Z,ZK  5  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design, It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to seme projects.  NI-DSW  Design Sprint  Z  2  Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Du the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD  Public Services Design  AZ  4  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 suppliers (devs and designesr) as well as clients. In small teams stude	NIE-BLO	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn Blockchain	t. After completing to cowledge to real-wo	he course, stud	dents should be allenges.	able to d	lesign and
Supervising implementation of blockchain-based solutions in both academia and business.  NI-CTF Capture The Flag The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP Cultural and Social Anthropology The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples of anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH Game Design The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to seme projects.  NI-DSW Design Sprint Z 2 Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Dut the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4 The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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.	NIE-BLO Students will understa	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn Blockchain and the foundations of blockchain technology, smart contract programming, and gain an over	t. After completing to the completing to the completing to the complete to the	he course, studing medical cha	dents should be a lallenges.  Z,ZK platforms. They we	able to d	lesign and  5 le to design
NI-CTF Capture The Flag The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP Cultural and Social Anthropology The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc) will shown. The course is pre-sented in Czech.  NI-DPH Game Design The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for perinterested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and gam development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semes projects.  NI-DSW Design Sprint Z 2 Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Dute the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4 The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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.  NI-DID Digital drawing The course will introduce students to t	NIE-BLO Students will understa	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn Blockchain and the foundations of blockchain technology, smart contract programming, and gain an ovecure decentralized application, and assess whether integration of a blockchain is suitable to	t. After completing to lowledge to real-wo erview of most notable for a given problem	he course, studing medical characteristics of the course place.	dents should be allenges.  Z,ZK platforms. They was aces an increase	ill be ab	5 le to design, asis on the
The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber security.  NI-CAP   Cultural and Social Anthropology  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples for anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH   Game Design   Z,ZK   5  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW   Design Sprint   Z   2  Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD   Public Services Design   KZ   4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective suppliers (devs and designers) 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-	NIE-BLO Students will understa code and deploy a se relationship between	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn Blockchain and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable blockchains and information security. It is concluded with a defense of a research or applies	t. After completing to lowledge to real-wo erview of most notable for a given problem	he course, studing medical characteristics of the course place.	dents should be allenges.  Z,ZK platforms. They was aces an increase	ill be ab	5 le to design, asis on the
NI-CAP Cultural and Social Anthropology  The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples f anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc) wil shown. The course is presented in Czech.  NI-DPH Game Design Z,ZK 5  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW Design Sprint  Z 2  Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design  KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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.  NI-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective	NIE-BLO Students will understate code and deploy a serelationship between supervising implement	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn Blockchain and the foundations of blockchain technology, smart contract programming, and gain an ovecure decentralized application, and assess whether integration of a blockchain is suitable blockchains and information security. It is concluded with a defense of a research or applientation of blockchain-based solutions in both academia and business.	t. After completing to lowledge to real-wo erview of most notable for a given problem	he course, studing medical characteristics of the course place.	dents should be allenges.  Z,ZK  colatforms. They waces an increase es the students for	ill be ab	5 le to design, asis on the menting or
The one-semester course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity of the world - examples for anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH Game Design The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW Design Sprint Z Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Duthe course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4 The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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. In small teams students will work on projects from partner organizations and will try out collaboration with client representatives. Course is aimed at students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will not one students to the basic principals of dig	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their kn Blockchain and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag	t. After completing to lowledge to real-wo erview of most notal for a given problem and semester project	he course, studind medical charled medical charled he blockchain parties. The course play, which prepare	dents should be allenges.  Z,ZK  colatforms. They waces an increase es the students for	ill be ab	5 le to design, asis on the menting or
anthropological research from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health, history, death, etc) will shown. The course is presented in Czech.  NI-DPH Game Design Z,ZK 5  The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW Design Sprint Z 2  Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Dut the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  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 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.  NI-DID Digital drawing  Z 2  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will not only a students will gain understanding of composition, perspective and color theory, will not only be students to the basic principals of digital drawing and graphical design. Students will gain	NIE-BLO Students will understate code and deploy a serelationship between supervising implemental NI-CTF The course is design.	udents will work on examples of processing various biosignals in the MATLAB environment to complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.    Capture The Flag   Capture Students to CTF competitions and let them gain practical experience in the	t. After completing to lowledge to real-wo erview of most notal for a given problem and semester project	he course, studind medical charled medical charled he blockchain parties. The course play, which prepare	dents should be allenges.  Z,ZK  platforms. They waces an increase es the students for KZ	ill be ab	5 le to design, asis on the menting or
Shown. The course is presented in Czech.  NI-DPH Game Design The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semes projects.  NI-DSW Design Sprint Z Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4 The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing Z 2 2 The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will not be course to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will not be course to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will not the course	NIE-BLO Students will understa code and deploy a se relationship between supervising implement NI-CTF The course is design	udents will work on examples of processing various biosignals in the MATLAB environment to complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain  and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology	t. After completing to well-dependent to the completion of the com	he course, studied medical charled medical charled he blockchain parties. The course play, which prepare this ity.	dents should be allenges.  Z,ZK  Datforms. They waces an increase es the students for KZ  ZK	able to c	5 le to design, asis on the menting or
NI-DPH Game Design The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW Design Sprint Z 2 Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Dut the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4 The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, when the course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, when the course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, when the course is a mec	NIE-BLO Students will understate code and deploy a ser relationship between supervising implemental NI-CTF The course is designated NI-CAP The one-semester code	udents will work on examples of processing various biosignals in the MATLAB environment to complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flagured to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology ourse aims to acquaint students with the basics of social and cultural anthropology as a science.	t. After completing to well-dependent to the completion of the com	he course, studied medical charled medical charled he blockchain parties. The course play, which prepare ity.	dents should be allenges.  Z,ZK  Datforms. They waces an increase es the students for KZ  ZK  ZK  Liversity of the wo	able to control ill be abled emphor implemental implemental in the control in the	5 le to design, asis on the menting or  4  2 umples from
The course complements the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game design. It is intended for per interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semes projects.  NI-DSW  Design Sprint  Z 2 Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD  Public Services Design  KZ 4 The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID  Digital drawing  Tecourse will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will necessary and serior process from the perspective and color theory, will necessary and serior process from the perspective and color theory, will necessary as understanding of composition, perspective and color theory, will necessary as the pers	NIE-BLO Students will understa code and deploy a se relationship between supervising implemen NI-CTF The course is design NI-CAP The one-semester co anthropological resea	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain  and the foundations of blockchain technology, smart contract programming, and gain an overective decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology ourse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalized).	t. After completing to well-dependent to the completion of the com	he course, studied medical charled medical charled he blockchain parties. The course play, which prepare ity.	dents should be allenges.  Z,ZK  Datforms. They waces an increase es the students for KZ  ZK  ZK  Liversity of the wo	able to control ill be abled emphor implementations and the control in the contro	5 le to design, asis on the menting or  4  2 umples from
interested in deeper knowledge of the principles used for games design, such as: level design, gameplay design, character design, game mechanics design, storytelling, and game development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW Design Sprint  Students will work on projects using the Design Sprint method, developed by Google. Thanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design  KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will necessary to the properties of the properties and color theory, will specified to the properties of the principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will provide the properties and the properties of the properties and color theory, will provide the properties of the principal properties and the properties of the	NIE-BLO Students will understate code and deploy a serelationship between supervising implemental NI-CTF The course is designated in the course is designated in the course is designated in the course is shown. The course is	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain  and the foundations of blockchain technology, smart contract programming, and gain an overeure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology purse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizators presented in Czech.	t. After completing to well-dependent to the completion of the com	he course, studied medical charled medical charled he blockchain parties. The course play, which prepare ity.	dents should be allenges.  Z,ZK  Datforms. They waces an increase es the students for KZ  ZK  Liversity of the word, health, history, or the students for the word, health, history, or the word, history,	able to control ill be abled emphor implementations and the control in the contro	5 le to design, asis on the menting or  4  2 amples from c) will be
development cycle. The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical implementation applied to semestrojects.  NI-DSW Design Sprint  Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design  KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will service the students of the past of	NIE-BLO Students will understate code and deploy a serilationship between supervising implemental NI-CTF The course is designated in the course is designated in the course is designated in the course is shown. The course is NI-DPH	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain  and the foundations of blockchain technology, smart contract programming, and gain an overeure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology purse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizator presented in Czech.  Game Design	t. After completing to well-dependent to the completing to move the completion of th	he course, studied medical charled medical charled he blockchain parties. The course play, which prepare tity.  The difference of the blockchain parties are played by the blockchain parties. The blockchain parties are played by the blockchain parties are played by the blockcharled by t	dents should be allenges.  Z,ZK  platforms. They waces an increase es the students for KZ  ZK  liversity of the word, health, history, of the word, health, history, of the word, health, history, or KZ	able to contain the second sec	5 le to design, asis on the menting or  4  2 amples from ac) will be
NI-DSW Design Sprint Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the passing principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the passing principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the passing principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the passing principals of digital drawing and graphical design.	NIE-BLO Students will understate code and deploy a serelationship between supervising implemental NI-CTF The course is designated in the course is designated in the course is number of the course complemental number of the course course is number of the course of the	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag end to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizator presented in Czech.  Game Design ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contains the content of the computer Games) and BI-VHS (Virtual gaming worlds) contents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contents the NI-APH (Architecture of Computer Games)	t. After completing to well a completing to well a completing to well a completing to well a complete well a complete with the complete well and the complete well a complete	he course, studied medical charled medical medical charled med	dents should be allenges.  Z,ZK platforms. They waces an increase es the students for KZ  ZK liversity of the word, health, history, of the word, and the students for the word for t	able to c	5 le to design asis on the menting or  4  2 amples from c) will be  5 d for people
NI-DSW Design Sprint Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, will students will gain understanding of composition, perspective and color theory, will students will gain understanding of composition, perspective and color theory, will students will gain understanding of composition, perspective and color theory, will students will gain understanding of composition, perspective and color theory, will students will gain understanding of composition, perspective and color theory, will students will gain understanding of composition.	NIE-BLO Students will understate code and deploy a serelationship between supervising implemental NI-CTF The course is designated in the course is designated in the course is number of the course is number of the course is number of the course complemental interested in deeper life code and the course complemental interested in deeper life code and deeper life course complemental interested in deeper life code and deeper life	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain  and the foundations of blockchain technology, smart contract programming, and gain an overective decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology purse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizator presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contended on the principles used for games design, such as: level design, gameplay design	t. After completing to well a sowledge to real-wo erview of most notate for a given problem and semester project field of cyber securentific discipline detaition, , material cultures, while focusing, character design,	he course, studied medical charled medical medical charled med	dents should be allenges.  Z,ZK platforms. They we aces an increase es the students for the work in the students of the work in the work i	ill be able to control in tende telling, a	5 le to design, asis on the menting or  4  2 amples from ac) will be  5 d for people and game
Students will work on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to validated prototype in 5 days. Due the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design  KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a students will gain understanding of composition, perspective and color theory, where the course will be a students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a students to the same than the course will be a students as a student of the course will be a students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a students are the course will be a students and the course will be a students will gain understanding of composition, perspective and color theory, where the course will be a students as the course will be a students and the course will be a students as	NIE-BLO Students will understate code and deploy a serilationship between supervising implemental NI-CTF The course is designated in the course is designated in the course is number of the course is number of the course is number of the course complement interested in deeper in development cycle. T	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain  and the foundations of blockchain technology, smart contract programming, and gain an overective decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applied intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology purse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizator presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contended on the principles used for games design, such as: level design, gameplay design	t. After completing to well a sowledge to real-wo erview of most notate for a given problem and semester project field of cyber securentific discipline detaition, , material cultures, while focusing, character design,	he course, studied medical charled medical medical charled med	dents should be allenges.  Z,ZK platforms. They we aces an increase es the students for the work in the students of the work in the work i	ill be able to control in tende telling, a	5 le to design, asis on the menting or  4  2 amples from ac) will be  5 d for people and game
the course the students will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting with research and finishing with testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspective 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-DID Digital drawing Z 2  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the students is to the starting transfer of the starting transfer of the starting transfer of the students and the starting transfer of the	NIE-BLO Students will understate code and deploy a serilationship between supervising implemental NI-CTF The course is design. NI-CAP The one-semester coanthropological resease shown. The course is NI-DPH The course complement interested in deeper I development cycle. T projects.	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and apply their knocomplex tasks for biosignals and biomedical programming, and gain an overescure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) controlled the principles used for games design, such as: level design, gameplay design he students will get an overview of game development from the designer's perspective, from	t. After completing to well a sowledge to real-wo erview of most notate for a given problem and semester project field of cyber securentific discipline detaition, , material cultures, while focusing, character design,	he course, studied medical charled medical medical charled med	dents should be allenges.  Z,ZK  platforms. They we aces an increase es the students for the work in the students of the students of the work in the students of the s	ill be able to control in tende telling, a	5 le to design, asis on the menting or  4  2 amples from (c) will be  5 d for people and game o semestral
testing the prototypes (plus final presentation).  NI-PSD Public Services Design KZ 4  The course will introduce students to specifics of UX, Service design and development for public sector. We will look into the design and development process from the perspectiv 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-DID Digital drawing Z 2  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the state of the prototypes o	NIE-BLO Students will understate code and deploy a serilationship between supervising implemental NI-CTF The course is designated in the course is designated in the course is number of the course is number of the course complement interested in deeper I development cycle. The projects.  NI-DSW	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and over execute decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization of the principles used for games design, such as: level design, gameplay design he students will get an overview of game development from the designer's perspective, from	t. After completing to the completing to the completing to the completion of the com	he course, studied medical charled medical medical medical charled medical medical charled medical medical medical charled medical charled medical medical charled medical cha	dents should be allenges.  Z,ZK platforms. They we aces an increase es the students for the work of th	ill be able to control in the state of the s	5 le to design, asis on the menting or  4 2 amples from ac) will be 5 d for people and game o semestral
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 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-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be supplied to the passing provided the color theory, where the course will be provided to the passing provided the color theory, where the course will be provided to the passing provided the color theory.	NIE-BLO Students will understate code and deploy a serilationship between supervising implement NI-CTF The course is design. NI-CAP The one-semester coanthropological resease shown. The course is NI-DPH The course complement interested in deeper leader development cycle. To projects. NI-DSW Students will work on	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical and vector of a blockchain is suitable to blockchains and information, security. It is concluded with a defense of a research or applies intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology  burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalized presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) controlled to the principles used for games design, such as: level design, gameplay design the students will get an overview of game development from the designer's perspective, from Design Sprint  projects using the Design Sprint method, developed by Google. Thanks to this method the	t. After completing to the completing to the completing to the completion of the com	he course, studied medical charled medical med	dents should be allenges.  Z,ZK  platforms. They we aces an increase es the students for the work in the students of the students of the students of the work in the students of the s	rld - exadeath, el	5 le to design asis on the menting or  4 2 amples from cc) will be 5 d for people and game o semestra 2 days. During
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 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-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the properties of the course will be a supplied to the properties of	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is design. NI-CAP The one-semester coanthropological resease shown. The course is NI-DPH The course complement interested in deeper leader development cycle. To projects. NI-DSW Students will work on the course the students.	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical programming, and gain an oversection of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies to the them gain practical experience in the Capture The Flag ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization presented in Czech.  Game Design Lents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) controlled to the principles used for games design, such as: level design, gameplay design he students will get an overview of game development from the designer's perspective, from Design Sprint with the method, developed by Google. Thanks to this method the ints will get familiar with the method as participants. Through practical challenges they will treat the programming and programming and programming and overgence of a research or a plockchain and overgence of a research or a plac	t. After completing to the completing to the completing to the completion of the com	he course, studied medical charled medical med	dents should be allenges.  Z,ZK  platforms. They we aces an increase es the students for the work in the students of the students of the students of the work in the students of the s	rld - exadeath, el	5 le to design, asis on the menting or  4 2 amples from (c) will be 5 d for people and game o semestral 2 days. During
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-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplied to the basic principals of digital drawing and graphical design.	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The one-semester coanthropological resease shown. The course is NI-DPH The course complement interested in deeper leader development cycle. The projects. NI-DSW Students will work on the course the student testing the prototypes	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical programming, and gain an overection of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology  burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contained to the principles used for games design, such as: level design, gameplay design the students will get an overview of game development from the designer's perspective, from the projects using the Design Sprint method, developed by Google. Thanks to this method the ints will get familiar with the method as participants. Through practical challenges they will the follows final presentation).	t. After completing to the completing to the completing to the completion of the com	he course, studied medical charled medical med	dents should be allenges.  Z,ZK  colatforms. They we aces an increase es the students for the students for the students for the students of th	rld - exadeath, el	5 le to design, asis on the menting or  4  2 amples from cc) will be  5 d for people and game to semestral  2 days. During ning with
Course is aimed at students-designers as well as clients.  NI-DID Digital drawing  The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplicated design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplicated design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplicated design. Students will gain understanding of composition, perspective and color theory, where the course will be a supplicated design.	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The course is designate in the course is designate. The course is NI-DPH The course complement interested in deeper lead to development cycle. The projects.  NI-DSW Students will work on the course the student testing the prototypes NI-PSD	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biosignals and apply their knocomplex tasks for interpret results, and apply their knocomplex tasks for interpret results, and apply their knocomplex tasks for interpret results, and apply their knocomplex tasks for biosignals and apply their knocomplex tasks for biosignals and apply their knocomplex tasks for biosignals and apply their knocomplex tasks for biosignal and outerpret results, and apply their knocomplex tasks for biosignals and apply their knocomple	t. After completing to the completing to the completing to the completing to the completion of the complete com	he course, studied medical charled medical med	dents should be allenges.  Z,ZK  collatforms. They we aces an increase es the students for the students for the students of th	able to color iill be abled emphor impler intende telling, applied to the intende telling applied to the intended telling applied telling applied telling applied to the intended telling applied t	5 le to design, asis on the menting or  4 2 amples from cc) will be 5 d for people and game to semestral  2 days. During hing with
NI-DID Digital drawing The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will introduce students to the basic principals of digital drawing and graphical design.	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The course is designate in the course is designate. The course is NI-DPH The course complement interested in deeper a development cycle. The projects. NI-DSW Students will work on the course the student testing the prototypest NI-PSD The course will introduce and deposit in the course the student testing the prototypest NI-PSD The course will introduce in the course will be course w	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biosignals and interpret results, and apply their knocomplex tasks for biosignals and biosignals in the foundations of blockchain tasks for biosignals and biosignals in the foundation of a blockchain tasks for biosignals and techniques in the foundation of a blockchain tasks for biosignal and techniques and apply their knocomplex tasks for biosignals and techniques, and apply their knocomplex tasks for biosignals and techniques and the foundation of a blockchain tasks for biosignals and techniques and their knocomplex ta	t. After completing to the completing to the completing to the completing to the completion of the complete com	he course, studied medical charled medical cha	dents should be allenges.  Z,ZK  collatforms. They we aces an increase es the students for the students for the students for the students of t	ill be able to control intended telling, applied to the period of the pe	sign and  5 le to design, asis on the menting or  4  2 amples from cc) will be  5 d for people and game to semestral  2 days. During hing with  4 rspective of
The course will introduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a student of the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a student of the basic principals of digital drawing and graphical design. Students will gain understanding of composition, perspective and color theory, where the course will be a student of the basic principals of digital drawing and graphical design.	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The course is designate in the course is designate in the course is NI-DPH The course complement cycle. The course is designate in the course is NI-DPH The course complement interested in deeper if development cycle. The course the students will work on the course the student testing the prototypest NI-PSD The course will introduce suppliers (devs and consequence in the course will introduce suppliers (devs and consequence in the course will introduce suppliers (devs and consequence in the course will introduce suppliers (devs and consequence in the course will introduce suppliers (devs and consequence in the course will introduce in the course will be	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignals and biomedical images, interpret results, and apply their knocomplex tasks for biosignal and over a policy the foundation of blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain is suitable to blockchain is suitable to blockchain is suitable to capture. It is concluded with a defense of a research or applies intation of blockchain is suitable to capture. It is concluded with a defense of a research or applies intation of blockchain is suitable to capture. It is concluded with a defense of a research or applies intation of a blockchain is suitable to conclude with a defense of a research or applies in a process depole and blockchain is suitable to conclude and the interpretation of blockchain technology, smart contract programming, and gain an over execute depole and blockchain to a process and and selection of a blockchain to search from participal the interpretation of a blockchain to search from the designals in the first known and assess whether integration of a blockchain to search from an applie to the first known and assess whether integration of a blockchain is suitable to search or a process whether integration of a blockchain and blockchai	t. After completing to the completing to the completing to the completing to the completion of the complete com	he course, studied medical charled medical cha	dents should be allenges.  Z,ZK  collatforms. They we aces an increase es the students for the students for the students for the students of t	ill be able to control intended telling, applied to the period of the pe	sign and  5 le to design, asis on the menting or  4  2 amples from cc) will be  5 d for people and game to semestral  2 days. During hing with  4 rspective of
	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The course is designate in the course is designate in the course is NI-DPH The course complement cycle. The course is not deeper interested in deeper inte	udents will work on examples of processing various biosignals in the MATLAB environment to complex tasks for biosignals and biomedical images, interpret results, and apply their known and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable a blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology burse aims to acquaint students with the basics of social and cultural anthropology as a sciarch from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizate presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contains the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contains will get an overview of game development from the designer's perspective, from Design Sprint  projects using the Design Sprint method, developed by Google. Thanks to this method the ints will get familiar with the method as participants. Through practical challenges they will to sect students to specifics of UX, Service design and development for public sector. We will designesr) as well as clients. In small teams students will work on projects from partner orgulatedness.	t. After completing to the completing to the completing to the completing to the completion of the complete com	he course, studied medical charled medical cha	dents should be allenges.  Z,ZK colatforms. They we aces an increase es the students for th	ill be able to control intended telling, applied to the period of the pe	5 le to design, asis on the menting or  4  2 Imples from cc) will be  5 d for people and game to semestral  2 days. During hing with  4 rspective of intatives.
they will practically apply in their own design works. Students will also gain experience in drawing and painting with digital and analog tools. The course is fit for anyone who wants	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The course is designate in the course is designate. The course is NI-DPH The course complement interested in deeper lead to development cycle. The course the student testing the prototypes NI-PSD The course will introduce suppliers (devs and course is aimed at st. NI-DID	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable a blockchains and information security. It is concluded with a defense of a research or applies intation of blockchain-based solutions in both academia and business.  Capture The Flag  ed to introduce students to CTF competitions and let them gain practical experience in the Cultural and Social Anthropology burse aims to acquaint students with the basics of social and cultural anthropology as a science from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalizate presented in Czech.  Game Design  ents the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) contained by the principles used for games design, such as: level design, gameplay design he students will get an overview of game development from the designer's perspective, from Design Sprint  projects using the Design Sprint method, developed by Google. Thanks to this method the ints will get familiar with the method as participants. Through practical challenges they will to section of UX, Service design and development for public sector. We will designesr) as well as clients. In small teams students will work on projects from partner orgulated travers.  Digital drawing	t. After completing to the completing to solve the completing to solve the completion of the complete the com	he course, studied medical charled medical cha	dents should be allenges.  Z,ZK colatforms. They we aces an increase es the students for th	ill be able to control intender telling, applied to the period finish	design and  5 de to design, asis on the menting or  4  2 design and  5 design and  4  2 design and  4  4  respective of attatives.  2
practice or learn drawing and painting. The course is organized as a thematic practices covering parts of theory and practical eversise to practice gained knowledge	NIE-BLO Students will understate code and deploy a serelationship between supervising implement NI-CTF The course is designate. The course is designate in the course is designate. The course is designate in the course is NI-DPH The course complement interested in deeper lead to development cycle. The course the student testing the prototypes NI-PSD The course will introduce suppliers (devs and course is aimed at still NI-DID The course will introduce the course is aimed at still not course is aimed at still not course will introduce the course will introduce the course is aimed at still not course will introduce the course will be course will introduce the course will be	udents will work on examples of processing various biosignals in the MATLAB environmento complex tasks for biosignals and biomedical images, interpret results, and apply their known blockchain and the foundations of blockchain technology, smart contract programming, and gain an overcure decentralized application, and assess whether integration of a blockchain is suitable to blockchains and information security. It is concluded with a defense of a research or applientation of blockchain-based solutions in both academia and business.    Capture The Flag	t. After completing to the completing to solve the completing to solve the completion of the complete the com	he course, studied medical charled medical med	dents should be allenges.  Z,ZK colatforms. They we aces an increase es the students for th	ill be able to color the period of the perio	sesign and  5 le to design, asis on the menting or  4  2 Imples from to) will be  5 d for people and game to semestral  2 days. During with  4 respective of intatives.  2 leeory, which

practice or learn drawing and painting. The course is organized as a thematic practices covering parts of theory and practical exercise to practice gained knowledge.

NI-DZO Digital Image Processing This course presents a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical algorithms that are both easy to implement and have an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is also valuable outside the domain of digital image processing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR compression, de-blurring in frequency domain, abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray conversion, context enhancement, interactive as-rigid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, adding depth, alpha matting. NI-DDM Distributed Data Mining Course focuses on state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hands on experience with large scale data processing framework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementations and will be capable to propose approaches to parallelize other algorithms. The course is prezented in czech language. Efficient Preprocessing and Parameterized Algorithms Z,ZK There are many optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necessary to solve these problems exactly in practice. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one can find a common property (parameter) of the inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponentially in this (small) parameter and polynomially in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time preprocessing of the input. which is not possible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution method. We will present a plethora of parameterized 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 will also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation schemes. NI-ESC **Experimental Project Course** ΚZ 8 "The Design Project course offers a holistic exploration of the design process, providing students with a well-rounded understanding of the principles, methodologies, and tools used in designing technology-driven solutions that are user-centric and industry-relevant. Throughout the semester, students will work on real-world design projects, collaborate with industry experts, and learn to integrate theory with practical application. Through a hands-on, project-based learning approach, students will develop their skills in user-centered design and user experience evaluation, as well as gain experience working in a team to design and prototype a functional solution." Z,ZK 4 NI-GLR Games and reinforcement learning The field of reinforcement learning is very hot recently, because of advances in deep learning, recurrent neural networks and general artificial intelligence. This course is intended to give you both theoretical and practical background so you can participate in related research activities. Presented in English. **Graph Neural Networks** 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. Z,ZK **Grid Computing** 5 Grid computing and gain knowledge about the world-wide network and computing infrastructure. 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 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-HSC Side-Channel Analysis in Hardware Z,ZK This course is dedicated to so-called side-channel information leakage in hardware devices. It focuses on both theoretical analysis and practical attacks. Students get familiar with various kinds of side channels and they get deeper insight in power attacks. Students learn to implement various profiled and non-profiled attacks and get familiar with higher-order attacks. They also get practice in both designing the SCA countermeasures and analyzing the amount and characteristics of the side-channel information leakage. NI-HMI2 History of Mathematics and Informatics ZK 3 This course is presented in Czech. Selected topics {Infinitesimal calculus, probability, number theory, general algebra, different examples of algorithms, transformations, recursive functions, eliptic curves, etc.) note on possibilities of applications of some mathematical methods in informatics and its development. NI-IBE Information Security 7K 2 Students learn information and IS/ICT security management systems (ISMS), methods for information access control, and basic norms and international standards in this area. They understand methods for management of internal and external security threats, for IS/IT security audits, and for application security testing (e.g., penetration testing). Intelligent embedded systems 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 of the Intelligent embedded system fundamentals course for the bachelor degree. The aim of the course is to teach students humanoid robot programming and advance application development. Lectures provide basis of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students develop advanced applications combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web technologies NI-IKM Internet and Classification Methods Z,ZK 4 In this course, the students get acquainted with classification methods used in four important internet, or generally network applications: in spam filtering, in recommendation systems, in malware detection systems and in intrusion detection systems. However, they will learn more than only how classification is performed when solving these four kinds of problems. 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. NI-IAM Internet and Multimedia 7.7K 4 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-IOT Z,ZK Internet of Things 4 The subject is focused on the area of hardware and software technologies for the strongly growing computer support of various devices. Its goal is familiarization with available development elements (Raspberry Pi, Arduino Due) and with the language for efficient application development and modification (GNU Forth). Introduction to European Economic History 7 7K The course introduces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economy through the description of the key periods in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic history. From large economic area of Roman Empire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutions is deciphered. The course does not cover detailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and organizations in history. Class meetings will consist of a mixture of lecture and discussion.

NULLATIO			
NI-KTH	Combinatorial Theories of Games	Z,ZK	4
	is a branch of mathematics, which has broad applications in economy, biology, politics and computer science. This theory st		_
" <i>'</i> /	mpetitive process by designing a mathematical model and investigating the strategies. The traditional task of classical game	•	
	ne game where no player wants to deviate from his strategy. Historically, the second big development in game theory of two-pl Berlekamp and Guy. They developed a theory, originally used for solving end-games in Go, into a full fledged field. The idea	=	
1 -	games can be added, that is, played simultaneously. This led to the algrebraic approach to study combinatorial games. The t	-	
	slished the theory of positional games (like tic-tac-toe and hex). In analysis of these game, one cannot escape the brute-force		-
is no efficient. Beck intro	duced the "false probabilistic method", which aims to tackhle this problem. In this course we build the foundation of the theo	ry of combinatoria	I and positional
•	oretical analysis of games and building the theory, not on the programming aspects of game solving algorithms. The course		
	se, think and proof. The course is also suitable for bachelors student in the third year, who attended introduction to graph the	eory, as well as for	PhD students
looking for research top		7 714	
NI-FMT	Finite model theory	Z,ZK	4
	to introduce students to the basics of finite model theory. The original motivation is the questions expressibility and verifiabilit		
·	tion 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.	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		-
· ·	udents to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique		
	e aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture an		_
(Institute of Intermedia F	FEL).		
NI-KYB	Cybernality	ZK	5
- '	with the fundamentals of legislation and international activities in the area of fighting cybercrime. Students will understand t		
	tems for computer surveillance and traffic monitoring in the cyberspace. Students will also familiarize themselves with hacker	activities and beha	vior. The course
	peration of the state agencies and subjects dealing with defence of the cyberspace (especially CSIRT and CERT teams).		
NI-LSM2	Statistical Modelling Lab	KZ	5
	vanced multiple target tracking (MTT). This domain covers simultaneous tracking of multiple targets using radar under the pre	esence of clutter, c	r video tracking.
	ne-art filters, in particular the PHD (Probability Hypothesis Density) and PMBM (Poisson Multi-Bernoulli) filters.	7 71/	
NI-LOM	Linear Optimization and Methods	Z,ZK	. 5
	cations of optimization methods in computer science, economics, and industry. They are aware of practical importance of line		
· ·	timization software and are familiar with languages used in programming of that software. They get skills in formalization of c Jling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, trav	-	•
•	and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems.	-	•
in linear programming.	and modelling of commote he the game theory. They get an everyon of compatitional complexity of optimization problems.	moy got onomatic	on in algorithmo
NI-MPL	Managerial Psychology	ZK	2
NI-MSI	Mathematical Structures in Computer Science	Z.ZK	4
	of programming languages. Data types as continous lattices, Scott topology. Procedures as continuous mappings. The Sco	1 ' 1	•
Introduction to category			
	uicory.		
NI-MZI	•	7.7K	4
NI-MZI In this course, students	Mathematics for data science	Z,ZK n data science. Th	•
In this course, students	•	n data science. Th	ne studied topics
In this course, students include mainly: linear alg	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in	n data science. Th	ne studied topics
In this course, students include mainly: linear alg	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principle).	n data science. Th	ne studied topics
In this course, students include mainly: linear alg selected notions from pr	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used i gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prir obability theory and statistics.	n data science. The nciple, gradient me	ne studied topics ethods) and
In this course, students include mainly: linear alg selected notions from printer IT-ITI with a very limited and ti	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics.  Modern IT infrastructure	n data science. The nciple, gradient me	the studied topics ethods) and 5
In this course, students include mainly: linear alg selected notions from print FIT-ITI with a very limited and to is understood here as a	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A	n data science. The ciple, gradient me Z,ZK  modern data or ces. The proposed seems	the studied topics ethods) and 5
In this course, students include mainly: linear alg selected notions from prince in the selected notion in the selected notions from prince in the selected notions from prince in the selected notion in the selecte	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo	n data science. The ciple, gradient med Z,ZK a modern data or ces. The proposed s	se studied topics sethods) and 5 computing center solution should
In this course, students include mainly: linear alg selected notions from property of the selected notion is understood here as a thus be capable of continuous NI-MOP Object-oriented program	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality print obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo uning is currently one of the most widespread paradigms of software creation, especially enterprise information systems, who	n data science. The ciple, gradient med Z,ZK a modern data or cost. The proposed service KZ ere its ability to na	se studied topics sethods) and 5 computing center solution should 4 tural abstraction
In this course, students include mainly: linear alg selected notions from property of the selected notions and selected notions of the selected notions of t	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo maining 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 programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course BI-OOP and aim to further deepen the standard programming in the course	n data science. The ciple, gradient med Z,ZK a modern data or ces. The proposed series ability to naskills of design and	se studied topics sethods) and 5 computing center solution should 4 tural abstraction implementation
In this course, students include mainly: linear alg selected notions from property of the selected notions from property of the selected notions from property of the selected notions from property of selected notions and selected notions. The selected notions of the sel	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 statem pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development	n data science. The ciple, gradient med Z,ZK a modern data or constitution and the constituti	se studied topics bethods) and 5 computing center colution should 4 tural abstraction in implementation of interest. In
In this course, students include mainly: linear alg selected notions from property of the selected notions and selected notions of the selected notions of t	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 statem pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to woo	n data science. The ciple, gradient med Z,ZK a modern data or constitution and the constituti	se studied topics sethods) and 5 computing center solution should 4 ctural abstraction of interest. In projects and OO
In this course, students include mainly: linear alg selected notions from property of the selected notions in the selected notion of the selected notions of the selected notions of the selected notions from property in the selected notions of the selected notions from property in the selected notion of the selected notions from property in the selected notion of the selected notions from property in the selected notion of the selected notions from property in the selected notion of the selected notions from the selected notion of th	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality print obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo uning 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 sector pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involved.	n data science. The ciple, gradient med Z,ZK a modern data or cas. The proposed series ability to na skills of design and threeds and areasork on interesting pyement in the Pha	5 omputing center colution should  4 tural abstraction of interest. In projects and OO ro Consortium.
In this course, students include mainly: linear alg selected notions from property of the selected notions and selected notions of the selected notions of t	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality print obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 statem pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involved.  Multiplatform development of mobile applications	n data science. The ciple, gradient med Z,ZK a modern data or constitution of the cons	5 omputing center colution should  4 tural abstraction of interest. In projects and OO ro Consortium.
In this course, students include mainly: linear alg selected notions from property of the selected notions and selected notions of the selected notions of t	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality print obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo uning 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 sector pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involved.	n data science. The ciple, gradient med Z,ZK a modern data or constitution of the cons	5 omputing center colution should  4 tural abstraction of interest. In projects and OO ro Consortium.
In this course, students include mainly: linear alg selected notions from property of the selected notions and selected notions of the selected notions of t	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo maining 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 section pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involved Multiplatform development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the state trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the state trends in mobile development technologies for iOS platform.	n data science. The ciple, gradient media Z,ZK a modern data or case. The proposed set a skills of design and the case and areas ork on interesting payement in the Pharameter of the passics from the	5 omputing center colution should  4 tural abstraction limplementation of interest. In projects and OO ro Consortium.  4 beginners class
In this course, students include mainly: linear alg selected notions from property of the selected notion of the selected notions of the selected notion of the selected notion of the selected notions	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prince obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 setern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involvements are strends in mobile development of mobile applications aftest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models	n data science. The ciple, gradient media Z,ZK a modern data or cless. The proposed set with the control of the	se studied topics ethods) and  5 computing center colution should  4 ctural abstraction implementation of interest. In projects and OO to Consortium.  4 beginners class
In this course, students include mainly: linear alg selected notions from property of the selected notions and selected notions of the selected notions of t	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prinobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo and it is course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the septent pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involved Multiplatform development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models.	n data science. The ciple, gradient media Z,ZK a modern data or cless. The proposed set with the control of the	se studied topics ethods) and  5 computing center colution should  4 ctural abstraction implementation of interest. In projects and OO to Consortium.  4 beginners class
In this course, students include mainly: linear alg selected notions from property of the selected notions as a selected notion of the sel	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used i gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prin obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 se dern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involve Multiplatform development of mobile applications steest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. guage models to solve problems, make informed risk assessments, and work critically with the scientific literature.	n data science. The ciple, gradient media Z,ZK a modern data or cless. The proposed set of the color of the c	se studied topics ethods) and  5 computing center solution should  4 tural abstraction and implementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach
In this course, students include mainly: linear alg selected notions from property of the prop	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo maining 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 section pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involved trends in mobile development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models guage models to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness	n data science. The ciple, gradient media z,ZK a modern data or cless. The proposed series ability to na skills of design and the cest and areas or k on interesting powement in the Phata KZ are basics from the z. The goal of the cest z,ZK	se studied topics sethods) and  5 computing center solution should  4 tural abstraction l implementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach
In this course, students include mainly: linear alg selected notions from property of the prop	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used i gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prin obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 se dern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involve Multiplatform development of mobile applications steest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. guage models to solve problems, make informed risk assessments, and work critically with the scientific literature.	n data science. The ciple, gradient media z,ZK a modern data or cless. The proposed series ability to na skills of design and the cless and areas or k on interesting powement in the Phata KZ are basics from the z. The goal of the country with the country to the	se studied topics sethods) and  5 computing center solution should  4 tural abstraction a fimplementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning
In this course, students include mainly: linear alg selected notions from property of the prop	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 section pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development of 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 involvements in mobile development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nethods based on randomness, are extremely important for the construction and training of neural networks as well as a nethods based on randomness, are extremely important for the construction and training of neural networks as well as a ne	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient constitution and areas of the constitution of design and the constitution of the constitut	se studied topics sethods) and  5 computing center solution should  4 tural abstraction a fimplementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on
In this course, students include mainly: linear alg selected notions from property of the prop	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 sedern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involvement of mobile applications attest trends in mobile development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a neural networks, machine learning and randomness" will discuss in sufficient depth a number of specific types of neural networks.	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient data or cless. The proposed set with the proposed sold sold sold sold sold sold sold sol	se studied topics sethods) and  5 computing center solution should  4 tural abstraction and implementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training
In this course, students include mainly: linear alg selected notions from property of the prop	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used it gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prince obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo maining 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 sedern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involved Multiplatform development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nural networks, machine learning and randomness" will discuss in sufficient depth a number of specific types of neural networks and mumber of specific stochastic methods for neural networks and machine learning. In the final two topic	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient data or cless. The proposed set with the proposed soft of design and the compact of the compact	se studied topics sethods) and  5 computing center solution should  4 tural abstraction limplementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training are used in one
In this course, students include mainly: linear alg selected notions from property of the prop	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used i gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prin obability theory and statistics.  Modern IT infrastructure  me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo and in this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the stern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development of pict 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 involves test trends in mobile development of mobile applications at test trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models, guage models to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nurral networks, machine learning and randomness" will discuss in sufficient depth a number of specific types of neural network anumber of specific stochastic methods for neural networks and machine learning. In the final two topics, it explains the gene	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient data or cless. The proposed set with the proposed sold sold sold sold sold sold sold sol	se studied topics sethods) and  5 computing center solution should  4 tural abstraction and implementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training
In this course, students include mainly: linear alg selected notions from property of the property of the property of the most important agency of the most impor	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prin obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo maining 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 sedern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involvements and the statement of the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvements in mobile development of mobile applications attest trends in mobile development technologies for IOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nural networks, machine learning and randomness" will discuss in sufficient depth a number of specific	The goal of the country stream to the countr	se studied topics sethods) and  5 computing center solution should  4 tural abstraction of implementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to
In this course, students include mainly: linear alg selected notions from property of the property of the property of the most important agency of the property of the most important agency of the property of the most important agency of the property of the most important agency of the most important agenc	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used i gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prir obability theory and statistics.  Modern IT infrastructure  me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  Modern Object-Oriented Programming in Pharo mining is currently one of the most widespread paradigms of software creation, especially enterprise information systems, whodern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the statern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involves trends in mobile development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models  will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models, guage models to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness  methods based on randomness, are extremely important for the construction and training of neural networks as well as a neural network, machine learning and randomness' will discuss in sufficient depth a number of specific types of neura	The goal of the country stream to the countr	se studied topics sethods) and  5 computing center solution should  4 tural abstraction of implementation of interest. In projects and OO ro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to
In this course, students include mainly: linear alg selected notions from property of the property of the most important approperty. It is understood here as a thus be capable of continuous of the most important approperty. It is understood here as a thus be capable of continuous of the program is used to build complex of object systems in monaddition to deepening of technologies in terms of the MI-MMA students will learn the label of the students will learn the label of the students how to use lan NI-NLM In this course, students students how to use lan NI-NMS Stochastic methods, i.e. models. The course "Ne randomness, as well as neural networks and shoof the most important ap NI-NMU The course introduces of familiarize the student wart projects.	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prin obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 selem pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development of gernaming skills, which are generally applicable in other OO languages, students will also gain the opportunity to wo semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involves trends in mobile development of mobile applications atest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Power of specific stochastic methods for neural networks and machine learning of neural networks as well as a neural networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a neural network, machine learning and randomness will discuss in sufficient depth a number of specific types of neural networks and m	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient so case. The proposed so case. The proposed so case is ability to naskills of design and the theorem and areas ork on interesting powement in the Phall KZ are basics from the case is a case of the c	se studied topics sethods) and  5 computing center solution should  4 tural abstraction of interest. In projects and OO pro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to oted to specific
In this course, students include mainly: linear alg selected notions from property of the property of the property of the most important agency of the projects.  NI-MMA  Students will learn the last of the most important agency of the most important agency of the projects.  NI-NLM  In this course, students students how to use lant of the most important agency of	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in globra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prirobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 experimental expects of the view with the development of 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 involongments of the mobile development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models guage models to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nural networks, machine learning and randomness' will discuss in sufficient depth a number of specific types of neural networks and machine learning. In the final two topics, it explains the gen	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient so case. The proposed so the color of the co	se studied topics sethods) and  5 computing center solution should  4 tural abstraction of interest. In projects and OO pro Consortium.  4 beginners class  5 course is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to oted to specific
In this course, students include mainly: linear alg selected notions from property of the property of the property of the most important agency of the following of the most important agency of the property of the most important agency of the property of the most important agency of the most important agen	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in globra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prirobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 sedern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involves trends in mobile development of mobile applications.  Itest trends in mobile development of mobile applications are sufficiently applicated to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Sugage models to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nural networks, machine learning and randomness in ne	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient so case. The proposed so the color of the co	sethods) and  5 computing center solution should  4 tural abstraction I implementation of interest. In projects and OO pro Consortium.  4 beginners class  5 curse is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to oted to specific  4 sors and FPGAs
In this course, students include mainly: linear alg selected notions from property of the property of the property of the most important agency of the most important agency of the most important agency of the course introduces a familiarize the student wart projects.  NI-NIMU The course introduces a familiarize the student systems and the most important agency of the most important agency o	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used i gebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prin obability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 select 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 involves Multiplatform development of mobile applications attest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Postgram and the properties of the selection of specific stoes of problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a neural network, machine learning and randomness' will discuss in sufficient depth a number of specific stypes of neural networks and machine learning, In the final two topics, it explains the gene over t	The goal of the country stream	sethods) and  5 computing center solution should  4 tural abstraction I implementation of interest. In projects and OO pro Consortium.  4 beginners class  5 curse is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to oted to specific  4 sors and FPGAs
In this course, students include mainly: linear alg selected notions from property of the property of the property of the most important agency of the most important agency of the most important agency of the course introduces a familiarize the student wart projects.  NI-NIMU The course introduces a familiarize the student systems and the most important agency of the most important agency o	Mathematics for data science are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in globra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality prirobability theory and statistics.  Modern IT infrastructure me-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologie nuous and economically optimal operation.  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 sedern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development object 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 involves trends in mobile development of mobile applications.  Itest trends in mobile development of mobile applications are sufficiently applicated to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Language Models will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. Sugage models to solve problems, make informed risk assessments, and work critically with the scientific literature.  Neural Networks, Machine Learning and Randomness methods based on randomness, are extremely important for the construction and training of neural networks as well as a nural networks, machine learning and randomness in ne	n data science. The ciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient mediciple, gradient so case. The proposed so case. The proposed so case is ability to naskills of design and the needs and areas ork on interesting powement in the Phamark of the case is a case of the case	sethods) and  5 computing center solution should  4 tural abstraction I implementation of interest. In projects and OO pro Consortium.  4 beginners class  5 curse is to teach  4 chine learning antially on roach to training are used in one  3 ain goal is to oted to specific  4 sors and FPGAs

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 character		
entities. While PML is commonly used in applications such as recommender systems, which recommend items to users based on their personal in to a wide range of other fields, including education, medicine, and chemical engineering. In this course, we will explore the latest PML methods from t		
perspectives. Specifically, we will focus on cutting-edge models that are of interest to both the research and commercial communities.	, 0	
NI-ARI Computer arithmetic	Z,ZK	4
Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementation units.		
NI-PG1   Computer Grafics 1	ZK	4
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 knowled interested in advanced computer graphics. Students will gain practical knowledge with realistic texturing and raytracing methods. An integral part of	-	_
articles and their subsequent implementation. The course will be followed by a course PG2 supplementing the knowledge of PG1 on other areas a		-
NI-PIV Computer Vision	Z,ZK	5
The Computer Vision course focuses on the theoretical and practical mastery of modern methods and algorithms in the field of image data processi	-	-
the basic principles of computer vision, gradually move to advanced computer vision techniques using deep learning. Emphasis is placed on theor practical applications and implementation of learned methods during exercises. Topics covered include morphological operations, image filtering, co	_	
and recognition and segmentation through classical and recent approaches based on deep learning, deep neural networks for computer vision (in	· ·	-
motion detection, visual expressiveness (saliency).		
NI-EDW Enterprise Data Warehouse Systems	Z,ZK	5
The Enterprise Data Warehouses course focuses on the area of business intelligence. Students will be introduced to business intelligence method not only in designing warehouses and various architectures, but also their deployment and maintenance. This course also includes an introduction		_
visualization.	to the area of repor	ting and data
NI-PVR Advanced Virtual Reality	KZ	4
The course introduces advanced parts of the virtual reality. It is a continuation of the already running graphic objects, especially the creation of 3D running graphic objects, especially the creation of 3D running graphic objects.	models in Blender, a	and among other
things, it introduces students to their application in virtual reality. Lectures will focus on virtual reality technology, its use in various applications and will be a subject to their applications and will be a subject to their applications.		
in available 3D engines (mainly Unity3D). The course is freely connected with the subject VHS (virtual game worlds), students will be able to apply tin virtual reality, or directly create a complex game for VR.	the knowledge gaine	ed in this subject
NI-AML Advanced machine learning	Z,ZK	5
The course introduces students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field		_
processing, control and interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the	e methods discusse	ed.
NI-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 BI-IOS.	the basics from the	beginners class
NI-PVS Advanced embedded systems	Z,ZK	4
The course is focused on ARM processors and microcontrollers and their usage in wide range of applications. The course includes a series of adv	1 '	•
working with mass storage devices, motor control, system control and industrial communication. The students obtain both theoretical and also practical communication.	ctical experiences w	rith embedded
systems.		
NI-DNP Advanced .NET	Z,ZK	4
Students will acquire an overview of platform .NET and will gain knowledge about technologies ASP.NET Core, Entity Framework Core, .NET MAL		
get notions of Azure DevOps and GIT. Students will get practical experience in semestral work where they will create a client-server application util		
get notions of Azure DevOps and GIT. Students will get practical experience in semestral work where they will create a client-server application uti Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.		
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Python.	KZ rthon (BI-PYT) left of	ASP.NET Core,  4 f. The course is
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course.	KZ rthon (BI-PYT) left of	ASP.NET Core,  4 f. The course is
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.	KZ whon (BI-PYT) left c	4 f. The course is lead by external
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course.	KZ thon (BI-PYT) left c	4 f. The course is lead by external
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning	KZ thon (BI-PYT) left cowork. The course is  KZ e learning framewo	4 f. The course is lead by external  5 rk. Throughout
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.	KZ thon (BI-PYT) left cowork. The course is  KZ e learning framewo such as computer vi	4 f. The course is lead by external  5 rk. Throughout sion and natural
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1	KZ thon (BI-PYT) left cowork. The course is  KZ e learning framewo	4 f. The course is lead by external  5 rk. Throughout
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.	KZ thon (BI-PYT) left cowork. The course is  KZ e learning framewo such as computer visual KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1	KZ thon (BI-PYT) left cowork. The course is  KZ e learning framewo such as computer vi	4 f. The course is lead by external  5 rk. Throughout sion and natural
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2	KZ thon (BI-PYT) left cowork. The course is  KZ e learning framewo such as computer visual KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.	KZ  thon (BI-PYT) left control of the course is the course in the course is the course in the course is the course in the course in the course is the course in the course in the course in the course is the course in the course	4 f. The course is lead by external  5 rk. Throughout sion and natural  5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4	KZ thon (BI-PYT) left cowork. The course is KZ e learning framewo such as computer vis KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machine the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.	KZ thon (BI-PYT) left cework. The course is  KZ e learning framewo such as computer vi  KZ  KZ  KZ  KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5  Programming Practices 5	KZ  thon (BI-PYT) left control of the course is the course in the course is the course in the course is the course in the course in the course is the course in the course in the course in the course is the course in the course	4 f. The course is lead by external  5 rk. Throughout sion and natural  5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5 This is a selective course for preparing talented student for representation in international programming contests.	KZ thon (BI-PYT) left cework. The course is  KZ e learning framewo such as computer vi  KZ  KZ  KZ  KZ  KZ  KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5  Programming Practices 5	KZ thon (BI-PYT) left cework. The course is  KZ e learning framewo such as computer vi  KZ  KZ  KZ  KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  NI-GOL Programming of distributed systems in GO	KZ thon (BI-PYT) left cework. The course is  KZ e learning framewo such as computer vi  KZ  KZ  KZ  KZ  KZ  KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6  This is a selective course for preparing talented student for representation in international programming contests.  NI-GOL Programming of distributed systems in GO  NI-PSL Programming in Scala	KZ thon (BI-PYT) left cework. The course is  KZ e learning framewo such as computer vi  KZ  KZ  KZ  KZ  KZ  KZ  KZ  KZ  KZ  K	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 5 4
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields stanguage processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 5  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6  This is a selective course for preparing talented student for representation in international programming contests.  NI-GOL Programming of distributed systems in GO  NI-PSL Programming in Scala  The course introduces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language fe	KZ thon (BI-PYT) left cowork. The course is ework. The course is executed as computer vision of the course is executed as considerable as co	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 4 matching and
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning  This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields stanguage processing.  FIT-ACM1 Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6  This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6  This is a selective course for	KZ thon (BI-PYT) left cowork. The course is ework. The course is executed as computer vision of the course is executed as considerable as co	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 4 matching and
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Py very hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming of distributed systems in GO  NI-PSL Programming of	KZ thon (BI-PYT) left of ework. The course is ework. The course is executed as computer visible. KZ  KZ KZ KZ KZ KZ KZ KZ KZ KZ KZ KZ KZ	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 4 matching and
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python  The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Py very hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing	KZ thon (BI-PYT) left cowork. The course is ework. The course is executed as computer vision of the course is executed as considerable as co	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 4 matching and Play, Cassandra,
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Pyvery hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source maching the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields stanguage processing.  FIT-ACM1 Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming of distributed systems in GO  NI-PSL Programming in Scala Programming in Ruby This course is presented in Czech.  NI-ROZ Pattern Recognition	KZ thon (BI-PYT) left cowork. The course is kZ e learning framewo such as computer visit kZ	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 4 matching and Play, Cassandra,  4 5
Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.  NI-PYT Advanced Python The goal of this course is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Py very hands-on and it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral course teachers from Red Hat.  NIE-PDL Practical Deep Learning This course is designed to provide students with a comprehensive understanding of Deep Learning using PyTorch, a popular open-source machin the course, students will develop practical skills in building and training deep neural networks, using PyTorch to solve real-world problems in fields a language processing.  FIT-ACM1 Programming Practices 1 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM2 Programming Practices 2 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM3 Programming Practices 3 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM4 Programming Practices 4 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM5 Programming Practices 5 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing talented student for representation in international programming contests.  FIT-ACM6 Programming Practices 6 This is a selective course for preparing	KZ thon (BI-PYT) left of the tower with the course is the tower with t	4 f. The course is lead by external  5 rk. Throughout sion and natural  5 5 5 5 5 4 matching and Play, Cassandra,  4 5 h to pattern

NII DI CA	Description I consider Comings	7	0
NI-PLS4	Programming Language Seminar programming languages. It has the format of a reading group in which programming languages. It has the format of a reading group in which	Z	2 entific papers
	guages and related fields. Participating students are expected to present a paper of their interest and actively participate in the		
	n FIT and MFF CUNI. It is open to all students and researchers interested in programming languages.		
NI-PLS3	Programming Language Seminar	Z	2
	juage Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which	ch we discuss sci	entific papers
about programming lan	guages and related fields. Participating students are expected to present a paper of their interest and actively participate in the	he discussions. Th	e reading group
is a joint venue betwee	n FIT and MFF CUNI. It is open to all students and researchers interested in programming languages.		
NI-PLS2	Programming Language Seminar	Z	2
The Programming Lang	uage Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which	ch we discuss sci	entific papers
	guages and related fields. Participating students are expected to present a paper of their interest and actively participate in the	he discussions. Th	e reading group
	n FIT and MFF CUNI. It is open to all students and researchers interested in programming languages.	_	
NI-PLS1	Programming Language Seminar	Z	2
	juage Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which		
	guages and related fields. Participating students are expected to present a paper of their interest and actively participate in the	ne discussions. I r	ie reading group
	n FIT and MFF CUNI. It is open to all students and researchers interested in programming languages.	7	4
NI-SCE1	Computer Engineering Seminar Master I	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		
• • •	ssional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar tea	•	
semester.	isional incitative and/or work in K. A laboratories. The dapacity of the subject is infined by the possibilities of the seminal teat	chers. The topics	are new ior each
NI-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 resistance.		-
	ually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of		
	ssional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar tea		
semester.		·	
NI-SZ1	Knowledge Engineering Seminar Master I	Z	4
-	I 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		
	s well as FIT's own Summer Research Program (VyLet).		
NI-SZ2	Knowledge Engineering Seminar Master II	Z	4
On this seminar you wi	I 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.
Additionally, you will lea	rn how to properly present and read scientific papers. The work in the seminar will prepare you to attend (and profit from) top ma	achine learning an	d AI conferences
and summer schools, a	s well as FIT's own Summer Research Program (VyLet).		
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
	ion algorithms are described. Basics of EDA (Electronic Design Automation) systems are given, together with combinatorial	problems emergin	g in EDA.
NI-MLP	Machine Learning in Practice	Z,ZK	5
Applying machine learn	ing methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to	, ideally, technical	implementation.
<del>-</del>	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 unc		rt.
FIT-SEP	World Economy and Business	Z,ZK	4
•	d in Czech. The course introduces students of technical university to the international business. It does that predominantly by		
· -	d economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well		
· ·	ic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of	of discussions bas	sed on individual
	o take bachelor level of this course BIE-SEP as a prerequisite.	7 71/	4
NI-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 of the course introduces students of the course in the course		•
	It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about of sincess 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 cours	•	
NI-TVR	Virtual Reality Technology	Z,ZK	3
	p virtual Neality Technology ced to the basic concepts of virtual reality. Techniques for displaying virtual worlds (CAVE, HMD,) and the possibilities of c		_
	eye tracking) will be discussed. Furthermore, the concepts of mixed and augmented reality will be introduced. Finally, ways of	_	**
reality will be presented		or doing virtual air	a aagooa
NI-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 cla	1	-
	and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is		-
are treated individually			
· · · · · · · · · · · · · · · · · · ·	e. The capacity is limited by the the potentials of the teachers of the seminar.		4
other scholarly literatur		Z	
other scholarly literatur	Theoretical Seminar Master II	Z ssical reading gro	-
other scholarly literatur NI-TS2 Theoretical seminar is		ssical reading gro	up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually	Theoretical Seminar Master II ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clar	ssical reading gro	up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur	Theoretical Seminar Master II  ntended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clar and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is	ssical reading gro	up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3	Theoretical Seminar Master II  Intended 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. The capacity is limited by the the potentials of the teachers of the seminar.	ssical reading gro s a work with scie	up. The students ntific papers and 4
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is	Theoretical Seminar Master II  Intended 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. The capacity is limited by the the potentials of the teachers of the seminar.  Theoretical Seminar Master III	ssical reading gro s a work with scie  Z ssical reading gro	up. The students ntific papers and 4 up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is are treated individually	Theoretical Seminar Master II  Intended 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. The capacity is limited by the the potentials of the teachers of the seminar.  Theoretical Seminar Master III  Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class	ssical reading gro s a work with scie  Z ssical reading gro	up. The students ntific papers and 4 up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is are treated individually	Theoretical Seminar Master II Intended 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. The capacity is limited by the the potentials of the teachers of the seminar.  Theoretical Seminar Master III Intended 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	ssical reading gro s a work with scie  Z ssical reading gro	up. The students ntific papers and 4 up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is are treated individually other scholarly literatur NI-TS4	Theoretical Seminar Master II  Intended 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 capacity is limited by the the potentials of the teachers of the seminar.  Theoretical Seminar Master III  Intended 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 concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a concern themselves with interesting topics from the latest research in the area.	ssical reading gross a work with scie  Z ssical reading gross a work with scie	up. The students ntific papers and 4 up. The students ntific papers and
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is are treated individually other scholarly literatur NI-TS4 Theoretical seminar is	Theoretical Seminar Master II Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clarand concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is and concern themselves with interesting topics from the teachers of the seminar.  Theoretical Seminar Master III Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clarand concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is an integral part of the course	ssical reading gross a work with scie  Z ssical reading gross a work with scie  Z ssical reading gross are work with scie	up. The students ntific papers and 4 up. The students ntific papers and 4 up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is are treated individually other scholarly literatur NI-TS4 Theoretical seminar is are treated individually	Theoretical Seminar Master II  Intended 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 an integral part of the course is an integral seminar Master III  Theoretical Seminar Master III  Intended 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 an integral seminar Master IV  Theoretical Seminar Master IV  Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class the students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class the students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class the students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class the students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a class the students which want to come in deeper contact with contemporary theoretical computer science.	ssical reading gross a work with scie  Z ssical reading gross a work with scie  Z ssical reading gross are work with scie	up. The students ntific papers and 4 up. The students ntific papers and 4 up. The students
other scholarly literatur NI-TS2 Theoretical seminar is are treated individually other scholarly literatur NI-TS3 Theoretical seminar is are treated individually other scholarly literatur NI-TS4 Theoretical seminar is are treated individually	Theoretical Seminar Master II  Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clar and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a. The capacity is limited by the the potentials of the teachers of the seminar.  Theoretical Seminar Master III  Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clar and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a. The capacity is limited by the the potentials of the teachers of the seminar.  Theoretical Seminar Master IV  Intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a clar and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is	ssical reading gross a work with scie  Z ssical reading gross a work with scie  Z ssical reading gross are work with scie	up. The students ntific papers and 4 up. The students ntific papers and 4 up. The students

NI-TNN.25 The	eory of Neural Networks	Z,ZK	4
	now the foundation of artificial intelligence and the fastest-growing area of machine learning. This course introduces their	, ,	ations. It begins
	re, active dynamics, and adaptive dynamics (i.e., learning). Then it covers the theoretical basis of the most common type		ŭ
from the perceptron of the 19	950s to the transformer of 2017. Finally, using function approximation theory, it rigorously explains the most important the	eoretical result: the	universal
approximation capability of n			
NI-TNN The	eory of Neural Networks	Z,ZK	5
	now the foundation of artificial intelligence and the fastest-growing area of machine learning. This course introduces their	, ,	ations. It begins
with general conceptsstructu	re, active dynamics, and adaptive dynamics (i.e., learning). Then it covers the theoretical basis of the most common type	es of artificial neur	al networks,
from the perceptron of the 19	950s to the transformer of 2017. Finally, using function approximation theory, it rigorously explains the most important the	oretical result: the	universal
approximation capability of n	eural networks.		
NI-CPX Co	mplexity Theory	Z,ZK	5
Students will learn about the	fundamental classes of problems in the complexity theory and different models of algoritms and about implications of th	e theory concerni	ng practical
(in)tractability of difficult prob	lems.		
FIT-TOP Ac	ademic writing	Z	2
· ·	nd required part of research activity. It is not only about obtaining research results but also about applying them in the for	m of publication. V	Vriting scientific
publications can be useful fo	r students not only in their own publishing activities but also in the preparation of a bachelor's or master's thesis. In the co	ourse, students w	ill learn how to
write a scientific article, what	parts such an article should have, and how the peer review process works. Students will also try their hand at presenting	an article and revi	ewing someone
else's article. The course will	be taught in blocks, with theoretical part at the beginning of the semester and one practical at the end of the semester/beginning	ginning of the exa	m period. Dates
will be determined based on	the availability of enrolled students.		
NI-DVG Inti	roduction to Discrete and Computational Geometry	Z,ZK	5
The course intends to introdu	ice the students to the discipline of Discrete and Computational Geometry. The main goal of the course is to get familiar w	vith the most fund	amental notions
of this discipline, and to be a	ble to solve simple algorithmic problems with a geometric component.		
NI-LNG Inti	roduction to Linguistics for IT Students	ZK	2
This one-semester course sh	nould provide a gentle introduction to linguistics and language research for students majoring in IT and programming. Stu	ıdents get acqua	nted with basic
concepts used in language d	escriptions as well as major theories influencing the current mainstream in linguistics. Specific attention will be paid to er	npirical and quan	itative methods
in linguistics, including the us	se of language corpora, and to specific issues of Czech.		
NI-VEM Sc	entific thinking	KZ	2
The objective of the course is	s to get acquainted with scientific methods and discovery of order and laws of the universe, including the aspects of hum	an life. The subje	ct combines
scientific methods in natural	sciences, mathematics, computer science and humanities. Another aim is to introduce rules and requirements of scientif	ic communication	via research
papers and posters.			
NI-VOL Ele	ections	Z,ZK	5
We will cover the basics of (c	committee) elections and, in general, opinion aggregation.	'	
NI-VYC Co	mputability	Z,ZK	4
Classical theory of recursive	functions and effective computability.	, ,	
NI-VPR Re	search Project	Z	5
Student obtains the credits for	or published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.	'	
NI-ZS10 Ma	ster internship abroad for 10 credits	Z	10
· ·	n his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research inst	1	-
	ean for study affairs assesses the professional content. The student must provide evidence of the professional content and		
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 we	eks of full-time en	nployment with
a foreign institution. The max	imum 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.			
NI-ZS20 Ma	ster internship abroad for 20 credits	Z	20
	n his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research inst	itution. Before the	internship the
Dean of the FIT, or the vice-d	ean for study affairs assesses the professional content. The student must provide evidence of the professional content and	extent of the inte	rnship. 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 we	eks of full-time en	nployment with
a foreign institution. The max	imum 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.			
NI-ZS30 Ma	ster internship abroad for 30 credits	Z	30
·	hand language. Fook student can appeauithin his / her moster's degree have a foreign internable at a foreign university.		
	hzech language. Each student can once within his / her master's degree have a foreign internship at a foreign university	_	
	nzech language. Each student can once within his / her masters degree have a loreign internship at a loreign university le internship the Dean of the FIT, or the vice-dean for study affairs assesses the professional content. The student must pro rnship. Auxiliary courses MI-ZS10. MI-ZS20. MI-ZS30 are used used for the evidence and evaluation of the internship in IS	ovide evidence of	he professional

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-SP-VS.20

Name of the group: Elective Vocational Courses for Master Specialization System Programming

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

Credits in the group: 0

Note on the group:

Povinné předměty všech specializací s výjimkou této specializace.

140to on th	c 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
NI-ADM	Data Mining Algorithms Pavel Kordík, Daniel Vašata, Rodrigo Augusto Da Silva Alves Daniel Vašata Pavel Kordík (Gar.)	Z,ZK	5	2P+1C	L	V
NI-AIB	Algorithms of Information Security  Martin Jure ek, Olha Jure ková Martin Jure ek Martin Jure ek (Gar.)	Z,ZK	5	2P+1C	Z	V

NI-ADP	Architecture and Design patterns  Jan Kurš, Jan Zimolka, Ji í Borský, Marek B lohoubek, Tomáš Chvosta <b>Jan</b> Kurš Jan Kurš (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-AM1	Middleware Architectures 1  Jaroslav Kucha, Tomáš Vitvar Jaroslav Kucha Tomáš Vitvar (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-AM2	Middleware Architectures 2  Jaroslav Kucha, Tomáš Vitvar Jaroslav Kucha Tomáš Vitvar (Gar.)	Z,ZK	5	2P+1C	L	V
NI-BML	Bayesian Methods for Machine Learning Ond ej Tichý, Kamil Dedecius Ond ej Tichý Kamil Dedecius (Gar.)	KZ	5	2P+1C	L	V
NI-BVS	Embedded Security  Martin Novotný Martin Novotný (Gar.)	Z,ZK	5	2P+2C	L	V
NI-BKO	Error Control Codes Pavel Kubalik Pavel Kubalik (Gar.)	Z,ZK	5	2P+1C	L	V
NI-DSV	Distributed Systems and Computing Pavel Tvrdik Jan Fesl Pavel Tvrdik (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-DDW	Web Data Mining Milan Doj inovski, Jaroslav Kucha Jaroslav Kucha (Gar.)	Z,ZK	5	2P+1C	L	V
NI-EVY	Efficient Text Pattern Matching  Jan Holub Jan Holub Jan Holub (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-FME	Formal Methods and Specifications Stefan Ratschan Stefan Ratschan (Gar.)	Z,ZK	5	2P+1C	L	V
NI-GAK	Graph theory and combinatorics  Michal Opler Tomáš Valla Tomáš Valla (Gar.)	Z,ZK	5	2P+2C	L	V
NI-HWB	Hardware Security	Z,ZK	5	2P+2C	L	V
NI-KOD	Ji í Bu ek <b>Ji í Bu ek</b> Ji í Bu ek (Gar.)  Data Compression	Z,ZK	5	2P+1C	L	V
NI-MKY	Jan Holub Jan Holub Jan Holub (Gar.)  Mathematics for Cryptology	Z,ZK	5	3P+1C	L	V
NI-MVI	Martin Jure ek, Róbert Lórencz Róbert Lórencz Róbert Lórencz (Gar.)  Computational Intelligence Methods	Z,ZK	5	2P+1C	Z	V
NI-MEP	Pavel Kordík Pavel Kordík Pavel Kordík (Gar.)  Modelling of Enterprise Processes	Z,ZK	5	2P+1C	Z	V
NI-MTI	Marek Suchánek, Robert Pergl Robert Pergl Robert Pergl (Gar.)  Modern Internet Technologies  Viktor erný, Alexandru Moucha Alexandru Moucha Alexandru Moucha	Z,ZK	5	2P+1C	Z	V
NI-NUR	User Interface Design	Z,ZK	5	2P+1C	Z	V
NI-NON	Josef Pavlí ek Josef Pavlí ek Josef Pavlí ek (Gar.)  Nonlinear Continuous Optimization and Numerical Methods	Z,ZK	5	2P+1C	Z,L	V
NI-NSS	Normalized Software Systems  Marek Suchánek, Robert Pergl, Jan Verelst Robert Pergl Robert Pergl (Gar.)	ZK	5	2P	L	V
NI-BUI	Business Informatics Petra Pavlí ková Petra Pavlí ková Petra Pavlí ková (Gar.)	Z,ZK	5	2P+2C	L	V
NI-PIS	Enterprise Information Systems Vlastimil Jinoch, Martin Závrbský, Martin Mach, Martin Hasaj David Buchtela David Buchtela (Gar.)	Z,ZK	5	2P+1C	L	V
NI-KRY	Advanced Cryptology Ji í Bu ek, Róbert Lórencz Ji í Bu ek Róbert Lórencz (Gar.)	Z,ZK	5	2P+2C	Z	V
NI-PAS	Advanced Aspects of Business David Buchtela, St pánka Havlíková, Dominik Vítek, Ji í Maršál, Jana Soukupová. Zden k Ku era David Buchtela Zden k Ku era (Gar.)	Z,ZK	4	2P+1C	Z	V
NI-PDB	Advanced Database Systems Yelena Trofimova, Michal Valenta Michal Valenta (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-GPU	GPU Architectures and Programming Ivan Šime ek Ivan Šime ek Ivan Šime ek (Gar.)	Z,ZK	5	2P+1C	L	V
NI-PDD	Data Preprocessing  Marcel Ji ina Marcel Ji ina (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-REV	Reverse Engineering	Z,ZK	5	1P+2C	Z	V
NI-SWE	Josef Kokeš Josef Kokeš Josef Kokeš (Gar.)  Semantic Web and Knowledge Graphs	Z,ZK	5	2P+1C	Z	V
NI-SIM	Milan Doj inovski Milan Doj inovski Milan Doj inovski (Gar.)  Digital Circuit Simulation and Verification	Z,ZK	5	2P+1C	L	V
NI-SIB	Martin Kohlík Martin Kohlík Martin Kohlík (Gar.)  Network Security  Ji í Dostál, Simona Forn sek, Martin Šutovský, Martin Holec Simona Forn sek	Z,ZK	5	2P+1C	L	V
NI-SCR	Ji i Dostál (Gar.)  Statistical Analysis of Time Series  Karil Dodosius Karil Bodosius (Car.)	Z,ZK	5	2P+1C	Z	V
NI-SYP	Kamil Dedecius Kamil Dedecius (Gar.)  Parsing and Compilers	Z,ZK	5	2P+1C	Z	V
NI-SBF	Jan Janoušek <b>Jan Janoušek</b> Jan Janoušek (Gar.)  System Security and Forensics Simona Forn sek, Marián Svetlík, David Pokorný Simona Forn sek Simona Forn sek (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-DSS	Decision Support Systems David Buchtela, Petra Pavlí ková, Robert Pergl David Buchtela Robert Pergl (Gar.)	Z,ZK	5	2P+1C	Z	V

NI-TES	Systems Theory Ji í Vysko il, Stefan Ratschan Stefan Ratschan (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-TSP	Testing and Reliability Petr Fišer Martin Da hel Petr Fišer (Gar.)	Z,ZK	5	2P+2C	Z	V
NI-TSW	Software Product Development Tomáš Šubrt, Petra Pavlí ková Petra Pavlí ková (Gar.)	KZ	4	1P+2C	Z	V
NI-UMI	Artificial intelligence Pavel Surynek Pavel Surynek (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-EHW	Embedded Hardware Jan Schmidt Jan Schmidt (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-ESW	Embedded Software Hana Kubátová, Miroslav Skrbek Miroslav Skrbek Hana Kubátová (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-VCC	Virtualization and Cloud Computing Jan Fest, Tomáš Vondra Tomáš Vondra Tomáš Vondra (Gar.)	Z,ZK	5	2P+1C	L	V
NI-PON	Selected Topics in Optimization and Numerical mathematics Št pán Starosta, Daniel Vašata, Karel Klouda <b>Daniel Vašata</b> Št pán Starosta (Gar.)	Z,ZK	5	2P+1C	L	V
NI-VMM	Retrieval from Multimedia Ji í Novák, Tomáš Skopal Jaroslav Kucha Tomáš Skopal (Gar.)	Z,ZK	5	2P+1C	Z	V
NI-MCC	Multicore CPU Computing Daniel Langr, Ivan Šime ek Ivan Šime ek (Gar.)	Z,ZK	5	2P+1C	Z	V
System Programmi	ne courses of this group of Study Plan: Code=NI-SP-VS.20 Name=Ele ng Parsing and Compilers	ective Vocati	onal Cou	<u> </u>	,ZK	pecialization 5
	e knowledge of fundamentals of automata theory, formal language and formal translation the	eories. Students	gain knowle			and applications
of LR parsing and are intro	oduced to special applications of parsers, such as incremental and parallel parsing.					
NI-ADM [	Data Mining Algorithms			Z	,ZK	5
The course focuses on alg	gorithms used in the fields of machine learning and data mining. However, this is not an int	troductory cours	e, and the	students shou	ıld know n	nachine learning
· · · · · ·	ut on advanced algorithms (e.g., gradient boosting) and non-basic kinds of machine learni	ing tasks (e.g., re	ecommend	ation systems	s) and mod	dels (e.g., kernel
methods).						
	Algorithms of Information Security				,ZK	5
	ed with the algorithms of secure key generation and cryptographic error (not only biometric)					
	c protocols (identification, authentication, and signature schemes). Another part of the cou		to malware	e detection ar	d the use	of machine
	ems. The last topic includes practical steganographic methods and attacks on steganograp	ohic systems.				
I .	Architecture and Design patterns			1	,ZK	5
The objective of this cours	se is to provide students with both work knowledge about the underlying foundations of ob	ject-oriented de	sign and ar	alysis as wel	l as with u	nderstanding of
•	d tradeoffs of advanced software design. In the first part of the course, the students will re	•				
•	ommonly used object-oriented design patterns that represent the best practices for solving		٠.			
•	inciples of software architecture design and analysis. This includes the classical architectur	ral styles, compo	nent based	systems, and	d some ad	vanced software
architectures used in large	e-scale distributed systems.					
NI-AM1	Middleware Architectures 1			Z	,ZK	5
Students will study new tre	ends, concepts, and technologies in the area of service-oriented architectures. The will ga	in an overview o	f information	on system arc	hitecture,	web service
architecture and aplication	servers. The will also study principles and technologies for middleware focused on applicati	ion integrations,	asynchrono	ous communic	ations and	d high availability
of applications.						
NI-AM2	Middleware Architectures 2			Z	,ZK	5
Students will learn new tre	ends and technologies on the Web including theoretical foundations. They will gain an over	rview of Web ap	olication ar	chitectures, c	oncepts a	nd technologies
for microservices, distrubu	uted cache and databases, smart contracts, realtime communication and web security.					
NI-BML E	Bayesian Methods for Machine Learning				ΚZ	5
· ·	practical use of basic Bayesian modeling methods in the dynamically evolving machine lea	arning theory. In	oarticular. i			
•	ion of real phenomena, as well as their subsequent use, e.g., for forecasting of future evol					
	tc.). The emphasis is put on understanding of explained principles and methods and their pr	_			•	
•	resented to students, for instance, 2D/3D object tracking, radiation source term estimation		•	•		•
some of them.	, , , , , , , , , , , , , , , , , , , ,			5 5 7 5		,
	Embedded Security			7	,ZK	5
	edge in selected topics of cryptography and cryptanalysis. The course focuses particularly	on efficient imple	mentations			
	d systems). Students gain a good overview of functionality of (hardware) cryptographic acce					
of computer systems.	a systems). Otalients gain a good overview or functionality of (natuwate) cryptographic acce	ciciators, smart	Julius, aliu l	COULICES IUI	occurring i	noma functions
	Fran Control Codos				71/	
NI-BKO E	Error Control Codes			2	,ZK	5

NI-EVY Efficient Text Pattern Matching

Distributed Systems and Computing

NI-DSV

NI-DDW

data and services, and safety in case of failures.

in the field of social web and recommendation systems.

Web Data Mining

The goal of the course is to present various ways to detect or correct individual errors and burst errors in data stored into memories or transmitted via channels.

Z,ZK 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.

Students are introduced to methods for coordination of processes in distributed environment characterised by nondeterministic time responses of computing processes and communication channels. They learn basic algorithms that assure correctness of computations realized by a group of loosely coupled processes and mechanisms that support high availability of both

Z,ZK

Z,ZK

5

5

Z,ZK Formal Methods and Specifications

Students will learn latest methods and technologies for web data acquisition, analysis and utilization of the discovered knowledge. Students will gain an overview of Web mining techniques for Web crawling, Web structure analysis, Web usage analysis, Web content mining and information extraction. Students will also gain an overview of most recent developments

Students are able to describe semantics of software formally and to use sound reasoning for construction of correct software. They learn to use some software tools that allow to prove basic properties of software.

NI-GAK Graph theory and combinatorics 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. NI-HWB Hardware Security Z,ZK 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. NI-KOD **Data Compression** Z,ZK 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 lossy data compression methods used in image, audio, and video compression. NI-MKY Mathematics for Cryptology 7.7K Students will gain deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In particular, the course focuses on the problem of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discrete logarithm. The problem of factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on lattices. NI-MVI Computational Intelligence Methods 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. Modelling of Enterprise Processes 5 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. 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. 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. NI-NON Nonlinear Continuous Optimization and Numerical Methods Z,ZK 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. ZK NI-NSS Normalized Software Systems Students will learn the foundations of normalized systems theory that studies the evolvability of modular structures based on concepts from engineering, such as stability from system theory and entropy from thermodynamics. Students will understand a set of principles that indicate where violations of stability and entropy-related issues occur in any given software architecture. In the second part of the course, students learn how to construct software architectures using 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 handling violations of the stability and entropy-related principles. This knowledge allows students to realize new levels of evolvability in software architectures. Business Informatics NI-BUI Z,ZK 5 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). NI-PIS **Enterprise Information Systems** Z,ZK The course is focused on the current IT requirements of large companies in the Czech Republic (Top 100). The basis is Data management, storage of big data (BigData) and their use in BI (Business Intelligence). The principles of solving the overall architecture of information systems in the banking, insurance and telecommunications sectors will be explained on real examples. Furthermore, students will get acquainted with the life cycle of information systems in the company / organization and its impact on the business strategy of the company. Students will be acquainted with technologies that have proven themselves in the elimination of basic risks in the planning, implementation and operation of information systems in the company / organization. NI-KRY Advanced Cryptology 5 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. Advanced Aspects of Business 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 Z,ZK 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-GPU **GPU** Architectures and Programming Z.ZK 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-PDD	Data Preprocessing	Z,ZK	5
	re raw data for further processing and analysis. They learn what algorithms can be used to extract information from various dat		- 1
	arn the skills to apply these theoretical concepts to solve specific problems in individual projects - e.g., extraction of character	ristics from image	s or from web
pages.			_
NI-REV	Reverse Engineering	Z,ZK	5
	nted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens I		
	nderstand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is ded		
• •	++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be doing work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the compute	•	, ,
	ning work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the compute ninars, where students will solve practically oriented tasks from the real world.	ei illaiware scene	s. The locus of
NI-SWE	Semantic Web and Knowledge Graphs	Z,ZK	5
-	he most recent concepts and technologies of the Semantic Web. The course will provide an overview of the Semantic Web te		-
	integration, publishing, querying and consumption of semantic data. The students will also gain skills in creation of knowledge	•	
quality assurance.	9,9,,	- 9p	,
NI-SIM	Digital Circuit Simulation and Verification	Z,ZK	5
	to acquaint the students with principles of digital circuit simulation at RTL (Register Transfer Level) and TLM (Transaction Le		
	ls. The course covers recent verification methods, too.	3,	
NI-SIB	Network Security	Z,ZK	5
NI-SCR	Statistical Analysis of Time Series	Z,ZK	5
	ne practical use of the basic time series modelling theory in engineering tasks, ranging from economics (stock exchange price	, , , , , , , , , , , , , , , , , , ,	-
	signals and processes) to computer networks (network components load, attacks detection). The students learn to select a co		
	its properties and use it for forecasting of future or intermediate values. The stress is put on understanding and adoption of the		
real-world examples. Bo	th the lab classes and the lectures exploit freely available software packages in order to provide easy and straightforward train	nsfer of students'	knowledge from
the academic to the rea	l world.		
NI-SBF	System Security and Forensics	Z,ZK	5
Students will get familia	r with aspects of system security (principles of end station security, principles of security policies, security models, authentica		urthermore,
students will get familiar	with forensic analysis as a tool for investigating security incidents (techniques used by malicious software/attackers and fore	nsic analysis tech	nniques and the
importance of operating	system/operating system artifacts or file system for attack analysis and detection).		
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	s of data-oriented	, model-oriented
and knowledge-oriented	l decision support systems. Students will also gain knowledge of multicriterial decision-making methods and game theory. They	will also learn abo	out the principles
of conceptually and onto	ologically oriented decision support systems and the basics of distribution, optimization and evolution methods and algorithm	S.	
NI-TES	Systems Theory	Z,ZK	5
Today, humankind has t	he ability to develop systems of incredible complexity (e.g., trains, microprocessors, airplanes, nuclear power plants). However	er, the costs of ma	anaging this
	ing the correct behavior of a given system have become critical. A key technique for mastering this complexity is the usage o		-
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 $i$		
		algorithms that to	rm the basis for
the modeling and analys	sis of complex systems.		
the modeling and analys	sis of complex systems.  Testing and Reliability	Z,ZK	5
the modeling and analyst NI-TSP Students will gain knowledge of the students will gain knowledge of th	resting and Reliability  edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to proceed the security of the securi	Z,ZK prepare a test set	5 with the help of
the modeling and analyst NI-TSP Students will gain know the intuitive path sensiti	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with	Z,ZK prepare a test set	5 with the help of
the modeling and analyst NI-TSP Students will gain know the intuitive path sensiti. will be able to compute,	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particular and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.	Z,ZK prepare a test set built-in-self-test e	5 with the help of equipment. They
the modeling and analyst NI-TSP Students will gain know the intuitive path sensiti. will be able to compute, NI-TSW	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development	Z,ZK prepare a test set	5 with the help of
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particular and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  If in Czech.	Z,ZK prepare a test set built-in-self-test e	5 with the help of equipment. They
the modeling and analys NI-TSP Students will gain know the intuitive path sensiti will be able to compute, NI-TSW The course is presented NI-UMI	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development at in Czech.  Artificial intelligence	Z,ZK prepare a test set built-in-self-test e  KZ  Z,ZK	5 with the help of equipment. They
the modeling and analyst NI-TSP Students will gain know the intuitive path sensition will be able to compute, NI-TSW The course is presented NI-UMI The course covers search	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate a skills to be able to particulate and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  If in Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program	Z,ZK prepare a test set built-in-self-test e  KZ  Z,ZK	5 with the help of equipment. They
the modeling and analyse NI-TSP Students will gain know the intuitive path sensition will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear. The main principles and	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development of in Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program of practical applications of discussed techniques will be illustrated.	Z,ZK prepare a test set built-in-self-test e  KZ  Z,ZK nming and autom	5 with the help of equipment. They  4  5 ated planning.
the modeling and analyse NI-TSP Students will gain know the intuitive path sensition will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development If in Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware	Z,ZK prepare a test set built-in-self-test e  KZ  Z,ZK nming and autom  Z,ZK	5 with the help of equipment. They  4  5 ated planning.
the modeling and analyse NI-TSP Students will gain know the intuitive path sensition will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate the stream of the reliability and availability of the designed circuits.  Software Product Development of in Czech.  Artificial intelligence chand inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the	Z,ZK prepare a test set built-in-self-test expenses at the set of advances.	5 with the help of equipment. They  4  5 ated planning.  5 sed embedded
the modeling and analyse NI-TSP Students will gain know the intuitive path sensition will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate a particulate and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development of in Czech.  Artificial intelligence chand inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware always and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed.	Z,ZK prepare a test set built-in-self-test expenses at the set of advances.	5 with the help of equipment. They  4  5 ated planning.  5 sed embedded
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication.	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  d in Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  always that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed ton, parallelism extraction and utilization in special structures and system architectures.	Z,ZK prepare a test set built-in-self-test expenses a test set built-in-self-test expenses at the control of th	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  d in Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the other specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software	Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK nming and autom  Z,ZK ne base of advanced, including stan  Z,ZK	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software course.	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical skills to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  In and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  In a their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  The course covers the areas from the great and such as the course covers the areas from the great acquainted students with the specifics of software development for embedded systems. The course covers the areas from the great acquainted students with the specifics of software development for embedded systems.	Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK nming and autom  Z,ZK ne base of advanced, including stan  Z,ZK e basic techniques	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communicating NI-ESW Embedded software could in C language and code	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical skills to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  In and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  It was that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the other specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing,	Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK nming and autom  Z,ZK ne base of advanced, including stan  Z,ZK e basic techniques	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communicatic NI-ESW Embedded software could in C language and code combined with artificial	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  I laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the other specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.	Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK nming and autom  Z,ZK ne base of advanced, including stan  Z,ZK e basic techniques up to sophisticate	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial NI-VCC	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to pation and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  In and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  I was that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing	Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK prepare a test set built-in-self-test of	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitive will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communicatiful NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain knowledges.	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to pation and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  I laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and	Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK prepare a test set set set set set set self-test of KZ  Z,ZK prepare a test set set set set self-test of KZ  Z,ZK prepare a test set set set set self-test of KZ  Z,ZK prepare a test set set set self-test of KZ  Z,ZK prepare a test set set set self-test of KZ  Z,ZK prepare a test set set set set self-test of KZ  Z,ZK prepare a test set set set set set set self-test of KZ  Z,ZK prepare a test set set set set set set set set se	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial NI-VCC Students will gain know acquainted with virtualize	Testing and Reliability edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate particu	Z,ZK prepare a test set built-in-self-test of built-in-self-test of the built-in-self-test of th	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communicatin NI-ESW Embedded software cour in C language and code combined with artificial NI-VCC Students will gain know acquainted with virtualiz performance parameter	Testing and Reliability edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate particu	Z,ZK prepare a test set built-in-self-test of built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare and autom  Z,ZK	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communicatin NI-ESW Embedded software cour in C language and code combined with artificial NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate the practical skills to be able to particulate the practical skills to be able to particulate the reliability and availability of the designed circuits.  Software Product Development  If in Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program a practical applications of discussed techniques will be illustrated.  Embedded Hardware It was that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the optimization of the program of th	Z,ZK prepare a test set built-in-self-test of built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare and autom  Z,ZK	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of comples and development tools (	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate the practical skills to be able to particulate the practical skills to be able to particulate and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  If in Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program a practical applications of discussed techniques will be illustrated.  Embedded Hardware  I laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rise acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficient of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skil Continuous integration and development).	Z,ZK prepare a test set built-in-self-test of built-in-self-test of KZ  Z,ZK prepare a test set built-in-self-test of KZ  Z,ZK prepare and autom  Z,ZK	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the ordern integration
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented The course is presented The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON)	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate the practical skills to be able to particulate the practical skills to be able to particulate and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  Chand inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the one parallelism extraction and utilization in special structures and system architectures.  Embedded Software  Is a special structure for effective computation and acceleration. Design of fast custom computing machines is discussed one, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  Is a sea acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing  ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and ration principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficate of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skill continuous integration and development).  Selected Topics in Optimization and Numerical mathematics	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of Z,ZK prepare and automore z,ZK prepare a devance and built-in-self-test of advance and including stan built-in-self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-test of a z,ZK  Description of the self-test of the self-te	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the odern integration
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualize performance parameter management of complex and development tools (NI-PON) The course focuses on controls and services and s	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to pation and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  I aws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rise acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and aution principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to effice of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effect of computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skil continuous integration and development).  Selected Topics in Optimization and Numerical mathematics optimization problems that appear in the field of machine learning and artificial intelligence. Students broaden their	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of Z,ZK prepare and automore and automore built-in-self-test of Z,ZK prepare and automore built-in-self-test of advance and in-self-test of advance and in-self-test of accordance and in-se	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the odern integration  5 nization obtained
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers sear The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to possible about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to possible to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development In Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the other in specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rea acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing  ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to effice of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to effice of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective computer systems and with spec	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of Z,ZK prepare and automore and automore built-in-self-test of Z,ZK prepare and automore built-in-self-test of advance and in-self-test of advance and in-self-test of accordance and in-se	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the odern integration  5 nization obtained
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to praction and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  d in Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint progran in practical applications of discussed techniques will be illustrated.  Embedded Hardware  Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the other specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficis of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effect is computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skil Continuous integration and development).  Selected Topics in Optimization and Numerical mathematics primization problems that appear in the field of machine learning and artificial intelligence. Students broaden	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare and autom  Z,ZK prepare a few prepared and continuous optimers. Hence, the results of the set of the results of the set of the se	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the odern integration  5 nization obtained elevant concepts
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM	Testing and Reliability edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to praction and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  than dinference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing  edge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and ration principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficit of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skil Continuous integration and development).  Selected Topics in Optimization and Numer	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of Z,ZK prepare a test set built-in-self-test of Z,ZK prepare and automore and automore built-in-self-test of advance and including stan according to sophisticate and automore built-in-self-test of advance and including stan according to sophisticate and including stan according to sophisticate and including stan according to sophisticate and including stan according to some standard sta	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the ordern integration  5 nization obtained elevant concepts
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains generally	Testing and Reliability ledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to praction and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  d in Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint progran in practical applications of discussed techniques will be illustrated.  Embedded Hardware  Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the other specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficis of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effect is computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skil Continuous integration and development).  Selected Topics in Optimization and Numerical mathematics primization problems that appear in the field of machine learning and artificial intelligence. Students broaden	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of Z,ZK prepare a test set built-in-self-test of Z,ZK prepare and automore and automore built-in-self-test of advance and including stan according to sophisticate and automore built-in-self-test of advance and including stan according to sophisticate and including stan according to sophisticate and including stan according to sophisticate and including stan according to some standard sta	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the ordern integration  5 nization obtained elevant concepts
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains genobjects, indexing, and si	Testing and Reliability edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to paration and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing  edge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and ration principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficis of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effects computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skil Continuous integration and development).  Selected Topics in Optimization and Numerical mathematics  primization problems that appear in the field of machine learning and artificial intelligence. Students broaden their kn	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare a diverse and built-in-self-test of advance and including stan kZ,ZK prepare a diverse and built-in-self-test of advance and including stan kZ,ZK prepare a diverse and including stan kZ,ZK prepare a diverse and including stan kZ,ZK prepare a diverse and including stan kZ,ZK prepare a test set set built-in-self-test of kZ,ZK prepare a test set set set set set set set set se	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hely will get and optimize the day for the ordern integration  5 nization obtained elevant concepts  5 from multimedia
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains genobjects, indexing, and sinuince NI-MCC	Testing and Reliability edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical substance of the substance o	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare a test set built-in-self-test of kZ  Z,ZK prepare a diverse and built-in-self-test of advance and including stan includ	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hey will get and optimize the day for the ordern integration  5 nization obtained elevant concepts  5 from multimedia
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains genobjects, indexing, and sinualized will get acquainted will get acquainted students will get a	Testing and Reliability dege about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate the gradient of the security and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  the and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  sea acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing dege of architectures of large computer systems that are used in data centers and computer infrastructure of companies and action principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to effice of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effect of combined and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skill continuous integration and development).  Selected Topics in Optimization and Numerical mathematics primization problems that appear in the field of machine learning and artificial intelligence.	Z,ZK prepare a test set built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of built-in-self-test of Z,ZK prepare a test set built-in-self-test of Z,ZK prepare and automore autom	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hely will get and optimize the day for the ordern integration  5 nization obtained elevant concepts  5 from multimedia  5 sors with shared
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains genobjects, indexing, and sinual virtually shared merital matematic will get acquain and virtually shared merital sensitive shared merital merital sensitive shared merital sensitive shared merital sensitive sensitive shared merital sensitive sensitive shared merital sensitive sensitive shared merital sensitive shared sensitive s	Testing and Reliability edge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to practical substance of the substance o	Z,ZK prepare a test set built-in-self-test et Z,ZK mming and autom  Z,ZK ne base of advance ed, including stan Z,ZK et basic techniques up to sophisticate  Z,ZK d organizations. Tociently operate arrive technology too ls in the use of more sive technology too ls in the use of more z,ZK frontinuous optimers. Hence, the reference extraction  Z,ZK frontinuous optimers. Hence, the reference extraction  Z,ZK multicore processed ge of architecture.	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hely will get and optimize the day for the ordern integration  5 nization obtained elevant concepts  5 from multimedia  5 sors with shared rally specific
the modeling and analyst NI-TSP Students will gain know the intuitive path sensitivill be able to compute, NI-TSW The course is presented NI-UMI The course covers searn The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of complex and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains genobjects, indexing, and sinually shared meroptimization techniques	Testing and Reliability dege about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particular and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development  In Czech.  Artificial intelligence  ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware  Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software  rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing ledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to effice of mochine terminal processing of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to effice of mochine terminal processing of the control of processing of the principles and gain practical skill continuous integration and development).  Selected Topics in Optimization and Numerical ma	Z,ZK prepare a test set built-in-self-test et Z,ZK mming and autom  Z,ZK ne base of advance ed, including stan Z,ZK et basic techniques up to sophisticate  Z,ZK d organizations. Tociently operate arrive technology too ls in the use of more sive technology too ls in the use of more z,ZK frontinuous optimers. Hence, the reference extraction  Z,ZK frontinuous optimers. Hence, the reference extraction  Z,ZK multicore processed ge of architecture.	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hely will get and optimize the day for the ordern integration  5 nization obtained elevant concepts  5 from multimedia  5 sors with shared rally specific
the modeling and analys NI-TSP Students will gain know the intuitive path sensitis will be able to compute, NI-TSW The course is presented NI-UMI The course is presented The main principles and NI-EHW The course brings basic systems, that profit from of internal communication NI-ESW Embedded software cour in C language and code combined with artificial in NI-VCC Students will gain know acquainted with virtualiz performance parameter management of comples and development tools (NI-PON) The course focuses on coin the course Mathemat of numerical matematics NI-VMM The student obtains genobjects, indexing, and sindical virtually shared meroptimization techniques	Testing and Reliability dedge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to particulate and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with analyze, and control the reliability and availability of the designed circuits.  Software Product Development in Czech.  Artificial intelligence ch and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint program practical applications of discussed techniques will be illustrated.  Embedded Hardware Laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed on, parallelism extraction and utilization in special structures and system architectures.  Embedded Software rese acquainted students with the specifics of software development for embedded systems. The course covers the areas from the optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, intelligence.  Virtualization and Cloud Computing edge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and cation principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficit or computer systems. Theoretically and practically, they will get acquainted with containerization as the most effect or computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skill Continuous integration and development).  Selected Topics in Optimization and Numerical mathematics primization problems that appear in the field of machine learning and artificial intelligence. Students broaden their knowled	Z,ZK prepare a test set built-in-self-test et Z,ZK mming and autom  Z,ZK ne base of advance ed, including stan Z,ZK et basic techniques up to sophisticate  Z,ZK d organizations. Tociently operate arrive technology too ls in the use of more sive technology too ls in the use of more z,ZK frontinuous optimers. Hence, the reference extraction  Z,ZK frontinuous optimers. Hence, the reference extraction  Z,ZK multicore processed ge of architecture.	5 with the help of equipment. They  4  5 ated planning.  5 ced embedded dardized means  5 of programming ed techniques  5 hely will get and optimize the day for the ordern integration  5 nization obtained elevant concepts  5 from multimedia  5 sors with shared rally specific

## List of courses of this pass:

Code	Name of the course	Completion	Credits
FIT-ACM1	Programming Practices 1  This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
FIT-ACM2	Programming Practices 2  This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
FIT-ACM3	Programming Practices 3  This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
FIT-ACM4	Programming Practices 4  This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
FIT-ACM5	Programming Practices 5  This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
FIT-ACM6	Programming Practices 6  This is a selective course for preparing talented student for representation in international programming contests.	KZ	5
FIT-ITI	Modern IT infrastructure	Z,ZK	5
with a very limited a	and time-invariable range of software or hardware, this subject tries to explain the issue as a whole and in the context of the time. A more	odern data or comp	uting center
is understood here	e as a complex whole, the individual parts of which must be reconciled from different aspects of the view using current technologies.  thus be capable of continuous and economically optimal operation.	The proposed solu	tion should
FIT-SEP	World Economy and Business	Z,ZK	4
This course is pres	sented in Czech. The course introduces students of technical university to the international business. It does that predominantly by c	omparing individua	l countries
, ,	vorld economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as nomic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of d readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite.		
FIT-TOP	Academic writing	Z	2
Publishing is an imp publications can be write a scientific arti	portant and required part of research activity. It is not only about obtaining research results but also about applying them in the form a useful for students not only in their own publishing activities but also in the preparation of a bachelor's or master's thesis. In the countrie, what parts such an article should have, and how the peer review process works. Students will also try their hand at presenting an oburse will be taught in blocks, with theoretical part at the beginning of the semester and one practical at the end of the semester/begin will be determined based on the availability of enrolled students.	of publication. Writi urse, students will le article and reviewir	ng scientific earn how to ng someone
FITE-EHD	Introduction to European Economic History	Z,ZK	3
	ices a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global eco		_
area of Roman Emp	in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic pire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institut tailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and meetings will consist of a mixture of lecture and discussion.	tions is deciphered.	The course
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 sis is put on advanced algorithms (e.g., gradient boosting) and non-basic kinds of machine learning tasks (e.g., recommendation sys methods).		_
NI-ADP	Architecture and Design patterns	Z,ZK	5
the challenges, issuand get familiar with	s course is to provide students with both work knowledge about the underlying foundations of object-oriented design and analysis as uses, and tradeoffs of advanced software design. In the first part of the course, the students will refresh and deepen their knowledge on 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.	of object-oriented p In the second part t	rogramming the students
AU AED	A P. I.E. 11 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	177	5
NI-AFP	Applied Functional Programming	KZ	
This course is presonant the rise nowadays	ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, maste necessary competence of a software engineer: the theory and especially the practice.	programming languaring this paradigm I	becomes a
This course is press the rise nowadays NI-AIB Students will get acc	ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, maste	orogramming languaring this paradigm languaring this paradigm languaring Z,ZK ents will learn the motion and the use of	becomes a  5 nathematica
This course is press the rise nowadays  NI-AIB Students will get acc principles of cryp  NI-AM1 Students will students	ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, maste necessary competence of a software engineer: the theory and especially the practice.  Algorithms of Information Security  quainted with the algorithms of secure key generation and cryptographic error (not only biometric) data processing. Furthermore, study tographic protocols (identification, authentication, and signature schemes). Another part of the course is dedicated to malware detections.	ring this paradigm languaring this paradigm languaring this paradigm languaring the motion and the use of the sems.	5 sathematica f machine 5 set service
This course is present the rise nowadays  NI-AIB  Students will get acception principles of cryp  NI-AM1  Students will students	ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, master necessary competence of a software engineer: the theory and especially the practice.  Algorithms of Information Security quainted with the algorithms of secure key generation and cryptographic error (not only biometric) data processing. Furthermore, study tographic protocols (identification, authentication, and signature schemes). Another part of the course is dedicated to malware detection and detection systems. The last topic includes practical steganographic methods and attacks on steganographic systems. Middleware Architectures 1  by new trends, concepts, and technologies in the area of service-oriented architectures. The will gain an overview of information systems in the servers. The will also study principles and technologies for middleware focused on application integrations, asynchronous comments.	Togramming languaring this paradigm languaring this paradigm languaring the matching and the use of the matchine and the use of the matchine architecture, we munications and hig	5 sathematica f machine 5 seb service h availability

NI-AOA	Completing a professional event	Z	1
	cipation in a one-off professional event, usually a lecture by a foreign guest of the FIT CTU, concluded with a workshop, a test, drafting	• .	
	I in advance by the vice-dean for pedagogical activities or the vice-dean for science and research and is presented within the FIT through		-
NI-APH	Architecture of computer games basic understanding of the various issues in the field of computer games development, especially from a technical point of view, but also	Z,ZK	4
•	ill get a grasp of component-oriented and functional-oriented architecture, game mechanics, decision-making processes and base co		
	es. They will also understand the basics of pathfinding, networking and scripting and apply them in practical exercises (labs). An impo		
	implementation of a simple game, with a strong focus on nontrivial game mechanics.		
NI-APR	Selected Methods for Program Analysis	Z,ZK	5
	ces you to program analysis, i.e., the automated reasoning about the behavior of a computer program. We will cover static and dynam	-	- 1
we will look at the a	art of reasoning about computer programs without running them. We will look at the analyses for program understanding, optimization  Analysis, we will look at the analyses considering individual program runs using a concrete environment and inputs.	is, error detection.	in Dynamic
NI-APT	Advanced Program Testing	Z,ZK	5
	is essential to ensure that a program respects its specification, that changes do not introduce regressions or security issues. The go		
	advanced program testing techniques, beyond writing unit tests, especially fuzzing and symbolic execution.		
NI-ARI	Computer arithmetic	Z,ZK	4
	Students will learn various data representations used in digital devices and will be able to design arithmetic operations implemental		
NI-ATH	AlgorithmicTheories of Games	Z,ZK	4
-	theory is a branch of mathematics, which has broad applications in economy, biology, politics and computer science. This theory studies competitive process by designing a mathematical model and investigating the strategies. The traditional task of classical game to		- 1
	ain competitive process by designinng a mathematical model and investigating the strategies. The traditional task of classical game tl s of the game where no player wants to deviate from his strategy. Due to the recent development of computers, internet, social network	=	-
	s and other concepts the algorithmic point of view is gaining attention. In addition to existential questions we study the problems of ef		- 1
	concepts. In this course we introduce the basics of game theory of many players, solution concept (usually equilibria) and methods o	•	
NI-BKO	Error Control Codes	Z,ZK	5
	l of the course is to present various ways to detect or correct individual errors and burst errors in data stored into memories or transn	nitted via channels.	
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 to		
	description of real phenomena, as well as their subsequent use, e.g., for forecasting of future evolution or learning about the hidden v tions etc.). The emphasis is put on understanding of explained principles and methods and their practical adoption. For this purpose, a r		
•	will be presented to students, for instance, 2D/3D object tracking, radiation source term estimation, or separation in medical imaging.		
	some of them.		,
NI-BPS	Wireless Computer Networks	Z,ZK	4
Students will learn	n about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad	-hoc networks, mul	ticast and
broadcast mechar	nisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowle	-	chanisms
NII DCO	for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitab		
NI-BSO	Biosignals and Biomedical Image Processing  Inse is to provide students with theoretical principles, techniques, and applications related to the processing and analysis of biological	Z,ZK	5
	students will work on examples of processing various biosignals in the MATLAB environment. After completing the course, students	•	~ I
-	ment solutions to complex tasks for biosignals and biomedical images, interpret results, and apply their knowledge to real-world med		
NI-BUI	Business Informatics	Z,ZK	5
	se is to focus on operational, tactical and strategic management of business informatics. Students will gain knowledge in the areas of business informatics.		- 1
	architectures in enterprise informatics. They will also learn about the principles, models and standards (ITIL, COBIT) in IT manageme	-	- 1
	nd resource management (sourcing). Students will learn the process of creating and implementing information strategy, IT Governance e context of information strategy with global business strategy. They will also gain knowledge in the areas of economic IT manageme	· · · · · · · · · · · · · · · · · · ·	
business and th	management, IT investment evaluation and human resources management in IT (roles CIO, CEO, CFO).	int, revenue and inv	esunent
NI-BVS	Embedded Security	Z,ZK	5
	knowledge in selected topics of cryptography and cryptanalysis. The course focuses particularly on efficient implementations of cryptography		
and software (in em	bedded systems). Students gain a good overview of functionality of (hardware) cryptographic accelerators, smart cards, and resources	for securing intern	al functions
	of computer systems.		
NI-CAP	Cultural and Social Anthropology	ZK	2
	course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversity earch from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, health		
antinopological res	shown. The course is presented in Czech.	i, filstory, deatif, et	) WIII DE
NI-CCC	Creative Coding and Computational Art	KZ	4
	ractical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the		
BLE,) and introdu	ces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique	s with artistic meth	ods using
modern technologi	es. The aim is to create an interesting visualization project. It is planned to work closely with IPR CAMP (Center of Architecture and N	Metropolitan Plannir	ng) and IIM
NII ODV	(Institute of Intermedia FEL).	7 71/	
NI-CPX	Complexity Theory	Z,ZK	5
Students will lear	n about the fundamental classes of problems in the complexity theory and different models of algoritms and about implications of the (in)tractability of difficult problems.	theory concerning	practical
NI-CTF	Capture The Flag	KZ	4
0	The course is designed to introduce students to CTF competitions and let them gain practical experience in the field of cyber se		.
NI-DDM	Distributed Data Mining	KZ	4
	state-of-the-art approaches for distributed data mining and parallelization of machine learning algorithms. Students will gain hands of		large scale
data processing fra	amework Apache Spark and with existing distributed DM / ML algorithms. They will learn principles of their parallel implementations a	nd will be capable	to propose
==:···	approaches to parallelize other algorithms. The course is prezented in czech language.		
NI-DDW	Web Data Mining	Z,ZK	5
	rn latest methods and technologies for web data acquisition, analysis and utilization of the discovered knowledge. Students will gain crawling, Web structure analysis, Web usage analysis, Web content mining and information extraction. Students will also gain an overvier		- 1
Communication view	in the field of social web and recommendation systems.	or most recent de	*Olobiligilio

NI-DID	Digital drawing	Z	2
	oduce students to the basic principals of digital drawing and graphical design. Students will gain understanding of composition, persp		
	apply in their own design works. Students will also gain experience in drawing and painting with digital and analog tools. The course learn drawing and painting. The course is organized as a thematic practices covering parts of theory and practical exercise to practi	=	
NI-DIP	Diploma Thesis	Z	30
NI-DNP	Advanced .NET	Z,ZK	4
	re an overview of platform .NET and will gain knowledge about technologies ASP.NET Core, Entity Framework Core, .NET MAUI (WI		· ·
	re DevOps and GIT. Students will get practical experience in semestral work where they will create a client-server application utilizing		
	Entity Framework Core and (Blazor, .NET MAUI or WPF) and also Azure DevOps and GIT.		
NI-DPH	Game Design	Z,ZK	5
	ments the NI-APH (Architecture of Computer Games) and BI-VHS (Virtual gaming worlds) course, while focusing primarily on game of er knowledge of the principles used for games design, such as: level design, gameplay design, character design,	_	
•	The students will get an overview of game development from the designer's perspective, from theoretical concepts to practical impler	0, , 0,	٠ ا
	projects.		
NI-DSS	Decision Support Systems	Z,ZK	5
	rse is to provide students with knowledge and skills in decision support systems, their classification (Powerova), selected principles of		
_	ented decision support systems. Students will also gain knowledge of multicriterial decision-making methods and game theory. They will		ne principles
NI-DSV	conceptually and ontologically oriented decision support systems and the basics of distribution, optimization and evolution methods a		5
- 1	Distributed Systems and Computing uced to methods for coordination of processes in distributed environment characterised by nondeterministic time responses of computing	z,ZK	-
	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.		,
NI-DSW	Design Sprint	Z	2
	on projects using the Design Sprint method, developed by Google. THanks to this method the teams are able to go from idea to valida		1
the course the stu	udents will get familiar with the method as participants. Through practical challenges they will try the whole 5 day process starting wit testing the prototypes (plus final presentation).	n research and fini	shing with
NI-DVG	Introduction to Discrete and Computational Geometry	Z,ZK	5
The course intends	to introduce the students to the discipline of Discrete and Computational Geometry. The main goal of the course is to get familiar with	the most fundame	ntal notions
NI DZO	of this discipline, and to be able to solve simple algorithmic problems with a geometric component.	7 71/	4
NI-DZO	Digital Image Processing  nts a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical alg	Z,ZK	th easy to
	e an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is al		
•	processing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR		
frequency domain,	abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray converges to the contraction of the color of t	ersion, context enl	hancement,
	gid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, and		
NI-EDW	Enterprise Data Warehouse Systems	Z,ZK	5
=	ta Warehouses course focuses on the area of business intelligence. Students will be introduced to business intelligence methods and ing warehouses and various architectures, but also their deployment and maintenance. This course also includes an introduction to t		- 1
	visualization.		
NI-EHW	Embedded Hardware	Z,ZK	5
_	basic laws that govern digital design and basic techniques to use them. It deals with both large and small scale systems. This is the from their specialized structure for effective computation and acceleration. Design of fast custom computing machines is discussed,		
systems, that prom	of internal communication, parallelism extraction and utilization in special structures and system architectures.	morading standard	izea means
NI-EPC	Effective C++ programming	Z,ZK	5
Students learn how	to use the modern features of contemporary versions of the C++ programming language for software development. The course focu	ses on programmin	ng effectivity
	iciency in the form of writing maintainable and portable source code and creating correct programs with low memory and processor to	· · · · · · · · · · · · · · · · · · ·	
NI-ESC	Experimental Project Course	KZ	8
	ct course offers a holistic exploration of the design process, providing students with a well-rounded understanding of the principles, n ology-driven solutions that are user-centric and industry-relevant. Throughout the semester, students will work on real-world design pro	-	
	nogy-driven solutions that are diserventile and industry-relevant. Hirodynout the seniester, students will work of rear-world design pro Into integrate theory with practical application. Through a hands-on, project-based learning approach, students will develop their skills	=	- 1
, ,	user experience evaluation, as well as gain experience working in a team to design and prototype a functional solution."		
NI-ESW	Embedded Software	Z,ZK	5
	e course acquainted students with the specifics of software development for embedded systems. The course covers the areas from the bar		1
in C language and	d code optimizations, through typical areas as the reliable software development, embedded operating systems, signal processing, up	o to sophisticated t	echniques
NI-EVY	combined with artificial intelligence.	Z,ZK	5
	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		
Gradomo gor mioni	They will be able to use the knowledge in design of applications that utilize pattern matching.	, a a	oop.oty.
NI-FME	Formal Methods and Specifications	Z,ZK	5
Students are able to	o describe semantics of software formally and to use sound reasoning for construction of correct software. They learn to use some so	ftware tools that all	low to prove
<b>.</b>	basic properties of software.		
NI-FMT	Finite model theory	Z,ZK	4
	se is to introduce students to the basics of finite model theory. The original motivation is the questions expressibility and verifiability of nception in the 1970s, the course has evolved rapidly and touched on many other areas of theoretical computer science, such as de-		
	Constraint Satisfaction Problem (CSP), the theory of algorithmic meta-theorems and combinatorics.	J complosity	,,,
NI-GAK	Graph theory and combinatorics	Z,ZK	5
The goal of the class	ss is to introduce the most important topics in graph theory, combinatorics, combinatorial structures, discrete models and algorithms.	The emphasis will	- 1
•	e basic principles but also on applications in problem solving and algorithm design. The topics include: generating functions, selected top	• .	,, , ,
coloring, Kamsey ti	heory, introduction to probabilistic method, properties of various special classes of graphs and combinatorial structures. The theory v of combinatorics on words, formal languages and bioinformatics.	nn be also applied	iii uie lielas
	and the second control of the second control		

NI-GEN	Code Generators	Z,ZK	5
Advanced techniq	ues of translating programs written in high-level programming languages are essential for understanding the field of systems progran	nming. This primari	ly involves
understanding the	algorithms and techniques used to translate more complex programming constructs of modern languages employed in systems progr	amming. Students v	will become
	familiar with both the theoretical and practical aspects of implementing the back-end of optimizing compilers for programming language.	guages.	
NI-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		ntended to
	give you both theoretical and practical background so you can participate in related research activities. Presented in English		
NI-GNN	Graph Neural Networks	Z,ZK	4
	•		
	oduces students to advanced artificial intelligence techniques for working with graphs. Lectures will focus on the latest graph neural n		۱ ۱
representations of	of nodes, edges and entire graphs. The techniques discussed cover various types of graphs, including time-varying graphs. The last p		so covers
	graph generation and interpretability of graph neural networks. In the exercises, students will try out selected techniques and pro-		
NI-GOL	Programming of distributed systems in GO	KZ	5
NI-GPU	GPU Architectures and Programming	Z,ZK	5
	nowledge of the internal architecture of modern massively parallel GPU processors. They will learn to program them mainly in the CUI	. , .	
-	videspread programming technology of GPU processors. As an integral part of the effective computational use of these hierarchical com		
William to dili oddy d v	will also learn optimization programming techniques and methods of programming multiprocessor GPU systems.	patationalotidotale	oo, otaaorito
NII ODI		7 71/	_
NI-GRI	Grid Computing	Z,ZK	5
	Grid computing and gain 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, info	ormation systems a	and assets,
the domain of cogi	nitive security is the protection of the human mind from intentional and unintentional digital manipulation. The topic of cognitive secur	ity is growing in imr	oortance in
•	nation warfare, increasing digital dependence and the development of artificial intelligence, where these phenomena from the Internet	, , , ,	
	impacts such as disruption of social cohesion, threats to democracy or war.		cai cociotai
NII LIMIO		71/	_
NI-HMI2	History of Mathematics and Informatics	ZK	3
This course is pro	esented in Czech. Selected topics {Infinitesimal calculus, probability, number theory, general algebra, different examples of algorithm		recursive
	functions, eliptic curves, etc.) note on possibilities of applications of some mathematical methods in informatics and its develop	ment.	
NI-HSC	Side-Channel Analysis in Hardware	Z,ZK	4
This course is de	dicated to so-called side-channel information leakage in hardware devices. It focuses on both theoretical analysis and practical attact	ks. Students get far	miliar with
various kinds of si	ide channels and they get deeper insight in power attacks. Students learn to implement various profiled and non-profiled attacks and	get familiar with his	gher-order
	hey also get practice in both designing the SCA countermeasures and analyzing the amount and characteristics of the side-channel	-	- 1
NI-HWB	Hardware Security	Z,ZK	5
	· · · · · · · · · · · · · · · · · · ·	. , .	-
	es the knowledge needed for the analysis and design of computer systems security solutions. Students get an overview of safeguard	-	-
-	eans. They will be able to safely use and integrate hardware components into systems and test them for resistance to attacks. Studen	=	age about
<del>-</del>	ptographic accelerators, PUF, random number generators, smart cards, biometric devices, and devices for internal security functions	of the computer.	
NI-IAM	Internet and Multimedia	Z,ZK	4
The NI-IAM cours	se is focused on principles and modern technologies for network transmissions of audiovisual (AV) signals. The syllabus includes acq	uisition of AV signa	ıls (input),
presentation of AV	signals (output), network communication protocols, device interfaces, codecs, data formats and stereoscopy. We will look at practical u	ise case scenarios	of real-time
audiovisual transn	nissions. Within the labs, students will practically assemble AV transmission chains using HW and SW technologies and verify the eff	ect of various comp	onents on
the quality and late	ncy of AV transmissions. Students will learn how to build Internet infrastructure for end-to-end AV transmissions from the recording th	e scene up to the p	resentation
. ,	for audience.		
NI-IBE	Information Security	ZK	2
	ormation and IS/ICT security management systems (ISMS), methods for information access control, and basic norms and internation		
	d methods for management of internal and external security threats, for IS/IT security audits, and for application security testing (e.g.		
NI-IKM	Internet and Classification Methods	Z,ZK	4
In this course, the s	students get acquainted with classification methods used in four important internet, or generally network applications: in spam filtering	, in recommendation	on systems,
in malware detecti	ion systems and in intrusion detection systems. However, they will learn more than only how classification is performed when solving	these four kinds of	problems.
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 w	ith 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 consul	t their semester tas	sks.
NI-IOS	Advanced techniques in iOS applications	KZ	4
	the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the b		
Students will learn	BI-IOS.	asios iroin the begi	IIIIeis Class
NII IOT		7.71	
NI-IOT	Internet of Things	Z,ZK	4
The subject is for	ocused on the area of hardware and software technologies for the strongly growing computer support of various devices. Its goal is fa		ıvailable
	development elements (Raspberry Pi, Arduino Due) and with the language for efficient application development and modification (G	NU Forth).	
NI-IVS	Intelligent embedded systems	KZ	4
Intelligent embedo	ed systems course for master's degree is focused on high-level technology embedded systems integrating artificial intelligence. The	course is an advar	ce version
of the Intelligent e	mbedded system fundamentals course for the bachelor degree. The aim of the course is to teach students humanoid robot program	ning and advance a	application
ŭ	ures provide basis of motion control, sensor reading, application interfaces, robot navigation and development tools. In labs, students of	•	
	combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web technical states of the combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web technical states of the combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web technical states of the combining algorithms.	•	
NI-KOD	Data Compression	Z,ZK	5
	ļ		
	duced to the basic principles of data compression. They will learn the necessary theoretical background and get an overview of data	-	- 1
useu iii practice. If	ne overview covers principles of integer coding and of statistical, dictionary, and context data compression methods. In addition, stude	and learn the funda	antentals of
	lossy data compression methods used in image, audio, and video compression.		
NI-KOP	Combinatorial Optimization	Z,ZK	6
The students will g	gain knowledge and understanding necessary deployment of combinatorial heuristics at a professional level. They will be able not onl	y to select and imp	lement but
	also to apply and evaluate heuristics for practical problems.		
NI-KRY	Advanced Cryptology	Z,ZK	5
	n the essentials of cryptanalysis and the mathematical principles of constructing symmetric and asymmetric ciphers. They will know t		
	generators. They will have an overview of cryptanalysis methods, elliptic curve cryptography and quantum cryptography, which they c	•	
.aaəm nambol (	their own systems or to the creation of their own software solutions.	577.7 10 1110 1110	g. ao., oi
	uten own systems of to the dealton of their OWI Sultware Sultituits.		

NI-KTH	Combinatorial Theories of Games	Z,ZK	4
_	theory is a branch of mathematics, which has broad applications in economy, biology, politics and computer science. This theory study		-
	tain competitive process by designing a mathematical model and investigating the strategies. The traditional task of classical game the	•	
	is of the game where no player wants to deviate from his strategy. Historically, the second big development in game theory of two-player onway, Berlekamp and Guy. They developed a theory, originally used for solving end-games in Go, into a full fledged field. The idea is		
-	onway, benekamp and Guy. They developed a theory, originally used for solving end-games in Go, into a full needed lend. The idea is patible games can be added, that is, played simultaneously. This led to the algrebraic approach to study combinatorial games. The thir	_	
	established the theory of positional games (like tic-tac-toe and hex). In analysis of these game, one cannot escape the brute-force tra	•	•
	k introduced the "false probabilistic method", which aims to tackhle this problem. In this course we build the foundation of the theory of	_	
	on theoretical analysis of games and building the theory, not on the programming aspects of game solving algorithms. The course requ		-
to mathematically	analyse, think and proof. The course is also suitable for bachelors student in the third year, who attended introduction to graph theory	, as well as for Phi	) students
	looking for research topics.		
NI-KYB	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		The course
	will also discuss the cooperation of the state agencies and subjects dealing with defence of the cyberspace (especially CSIRT and CE	RT teams).	
NI-LNG	Introduction to Linguistics for IT Students	ZK	2
	r course should provide a gentle introduction to linguistics and language research for students majoring in IT and programming. Stude		
concepts used in la	anguage descriptions as well as major theories influencing the current mainstream in linguistics. Specific attention will be paid to empi	rical and quantitati	ve methods
NII I ON	in linguistics, including the use of language corpora, and to specific issues of Czech.	7 71/	
NI-LOM	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 ith optimization software and are familiar with languages used in programming of that software. They get skills in formalization of optin		
	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	-	-
	in linear programming.	, 9	9
NI-LSM2	Statistical Modelling Lab	KZ	5
	is advanced multiple target tracking (MTT). This domain covers simultaneous tracking of multiple targets using radar under the presen		_
•	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	Z,ZK	5
Students will get ad	cquainted in detail with hardware support and programming technologies for the creation of parallel multithreaded computations on mu		with shared
and virtually sha	red memories, which are today the most common computing nodes of powerful (super)computer systems. Students will gain knowled	ge of architecturall	y specific
optimization techni	ques 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.		
NI-MEP	Modelling of Enterprise Processes	Z,ZK	5
The subject is	focused on introduction to the discipline of Enterprise Engineering. Students learn the importance of a proper methodological approach	ch for (re)engineer	ing and
	implementation of processes, organisation structures and information support in big enterprises and institutions.		
NI-MKY	Mathematics for Cryptology	Z,ZK	5
Students will gain	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In particular, the security of ciphers and the security of ciphers are concerning the security of ciphers.	particular, the cour	se focuses
Students will gain	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In portion of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret	particular, the cour e logarithm. The p	se focuses
Students will gain on the problem of	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In post solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on	particular, the count le logarithm. The pro- lattices.	se focuses roblem of
Students will gain on the problem on NI-MLP	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice	particular, the course logarithm. The properties.  Z,ZK	se focuses roblem of
Students will gain on the problem of NI-MLP Applying machine I	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possible of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide	particular, the cour e logarithm. The pr lattices. Z,ZK ally, technical imple	se focuses roblem of 5 ementation.
Students will gain on the problem of NI-MLP Applying machine I The course guides	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possible of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically.	particular, the course logarithm. The properties.  Z,ZK  ally, technical imple. The aim is to expe	se focuses roblem of 5 ementation. erience real
Students will gain on the problem of NI-MLP Applying machine I The course guides data proces	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possible of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sign and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and	particular, the cour e logarithm. The pr lattices. Z,ZK ally, technical imple The aim is to expe understandable re	se focuses roblem of 5 ementation. erience real port.
NI-MLP Applying machine I The course guides data proces NI-MMA	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sign and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications	particular, the course logarithm. The present the pres	5 ementation. erience real port.
NI-MLP Applying machine I The course guides data proces NI-MMA	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possible of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sign and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and	particular, the course logarithm. The present the pres	5 ementation. erience real port.
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and  Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the base of the process of the pro	particular, the course logarithm. The properties of the properties	5 ementation. erience real port. 4
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, issing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the base of the programming in Pharo	particular, the course logarithm. The properties of the properties	5 ementation. erience real port. 4 nners class
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn NI-MOP Object-oriented pro	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and  Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the base of the process of the pro	particular, the course logarithm. The properties of the properties	5 ementation. erience real cort. 4 nners class 4 abstraction
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on  Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically esting and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and  Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the base of the students in mobile development of the most widespread paradigms of software creation, especially enterprise information systems, where integrating in the process information systems, where integrating in the most widespread paradigms of software creation, especially enterprise information systems, where integrating in the most widespread paradigms of software creation, especially enterprise information systems, where integrating in the most widespread paradigms of software creation, especially enterprise information systems, where integrating in the most widespread paradigms of software creation, especially enterprise information systems, where integrating in the most widespread paradigms of software creation, especially enterprise information systems, where integrating in the most widespread paradigms of software creation, especially enterprise information systems.	particular, the course logarithm. The properties of the properties	5 ementation. erience real cort. 4 enners class 4 abstraction ementation
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn NI-MOP Object-oriented pro is used to build com of object systems	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, idea to students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear of the modern object-Oriented Programming in Pharo Cogramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in the proper in the proper in the stills of the course BI-OOP and aim to further deepen the skills of the proper in the course BI-OOP and aim to further deepen the skills of the most widespread paradigms of software creation.	particular, the course logarithm. The properties of the properties	5 ementation. erience real cort. 4 abstraction ementation interest. In
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear of the latest trends in mobile development provides for iOS platform. Class covers advanced topics, students need to know all the bear of the latest trends in mobile development development of programming in Pharo (modern Object-Oriented Programming in Pharo or o	particular, the course logarithm. The properties of the properties	5 ementation. erience real cort. 4 abstraction ementation ementation interest. In cts and OO
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibly a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, issing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear of the latest trends in mobile development performence of the most widespread paradigms of software creation, especially enterprise information systems, where in the process of the place of the most widespread paradigms of software creation, especially enterprise information systems, where in the process of the place of the most widespread paradigms of software creation, especially enterprise information systems, where in the process of the place of the place of the process of the programming in Pharo of the process of the process of the programming in process of the proces	particular, the course logarithm. The properties of the properties	5 ementation. erience real cort. 4 abstraction ementation ementation interest. In cts and OO
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course com	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibility of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide a students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautical property of the most widespread paradigms of software creation, especially enterprise information systems, where in plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development noting object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work of the semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Mathematics for Informatics  Prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analyse	particular, the course logarithm. The properties of the properties	5 ementation. Prience real port. 4 ementation ementation ementation ementation ementation ementation enterest. In cts and OO onsortium. 7 eation and
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibility of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discrete factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide is students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  The latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautiest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautiest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautiest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautiest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautiest trends in mobile development for individual approach to students, their development need to provide the process of the most widespread paradigms of software creation, especially enterprise information systems, where individual approach to students, their development need to provide the process of the proces	particular, the course logarithm. The properties of the properties	5 ementation. Prience real port. 4 abstraction ementation ementation ementation interest. In cts and OO onsortium. 7 ation and d numerical
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibility of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide is students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  The latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear BI-IOS.  Modern Object-Oriented Programming in Pharo Expramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in the programming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development not into the programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or the students will also gain the opportunity to work or the students of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analyst attability analysis. The	particular, the course logarithm. The properties of the properties	5 ementation. 5 ementation ementation ementation interest. In cts and OO onsortium. 7 eation and d numerical mentation.
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course com multi-variate integra algorithm and thei	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibility of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sting and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautic strends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautic strends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautic strends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautic strends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beautic strends in mobile development of the most widespread paradigms of software creation, especially enterprise information systems, where in please modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org).	particular, the course logarithm. The properties of the properties	5 ementation. 5 ementation. 6 d abstraction ementation ementation interest. In cts and OO onsortium. 7 ation and d numerical ementation. 2
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei NI-MPL NI-MPR	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibility of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discrete factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide a students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  The latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beauties trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beauties trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beauties trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beauties and platform of the most widespread paradigms of software creation, especially enterprise information systems, where in the latest trends in mobile applications. In this course, we build on the knowledge acquired in the course Bi-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development neing object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work of the most system plants. The possibility of cooperation	particular, the course logarithm. The properties of the properties	5 ementation.  4 abstraction ementation interest. In cts and OO onsortium.  7 ation and d numerical mentation.  2 7
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei NI-MPL NI-MPR 1. At the beginning	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possibility of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide is students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sting and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear of the most widespread paradigms of software creation, especially enterprise information systems, where in polex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development not into goige to programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work of the most students are generally applicable in other OO languages, students will also gain the opportunity to work of the most students with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Mathematics for Informatics  Informatics in the client to applications in computer science. It includes topics from multi-variate analyst attaining the properties of the semester, a student re	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 rementation. Prience real port.  4 rementation ementation ementation interest. In cts and OO onsortium.  7 reation and d numerical mentation.  2 7 carried out
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste	Mathematics for Cryptology  deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a foolving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice  learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically, using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the become success of the most widespread paradigms of software creation, especially enterprise information systems, where in plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development near of the programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or the some strain work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analyse ation. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last top restablity analysis. The topics are co	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 rementation. Prience real port.  4 rementation rementation rementation rementation rementation rementation rementation rementation.  7 retion and d numerical rementation.  2 7 carried out resulting the external
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t	Mathematics for Cryptology  deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a folving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice  learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide a students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beat self-los.    Modern Object-Oriented Programming in Pharo	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 rementation. Prience real port.  4 rementation dementation ementation ementation interest. In cts and OO onsortium.  7 retion and dementation.  2 7 carried out the external nulare). The
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically using and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear of the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear of the most widespread paradigms of software creation, especially enterprise information systems, where in modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development meting object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or most of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Mathematics for Informatics  Managerial Psychology  Master Project  go fithe semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 rementation. Prience real port.  4 remers class  4 rementation ementation ementation interest. In cts and OO onsortium.  7 retion and d numerical mentation.  2 recarried out the external nulare). The as reserved
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In possion of solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear or plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development noting object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or most of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analystation. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last top restablity analysis. The topics are completed with demonstration of applications in computer science. The course focuses on clear pre Managerial P	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 rementation. Prience real port.  4 remers class  4 rementation rementation rementation rementation rementation rementation and drumerical rementation.  2 recarried out the external relation. The reserved
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign is rather general,	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discrete factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the be BI-IOS.  Modern Object-Oriented Programming in Pharo gramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development not made in the programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or the semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analystation. The third large topic is computer arithmetics and number representation in a computer along with error ma	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 ementation. erience real port.  4 nners class  4 abstraction ementation interest. In cts and OO onsortium.  7 ation and d numerical mentation.  2 7 carried out he external nulare). The as reserved plete and
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter  NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign is rather general,	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a footing a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide at students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear in the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear in the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the bear in the latest trends in mobile development the programming in Pharo  Orgamming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in the proper in t	particular, the course logarithm. The production of the production	se focuses roblem of  5 ementation. erience real port.  4 nners class  4 abstraction ementation interest. In cts and OO onsortium.  7 ation and d numerical mentation.  2 7 carried out he external nulare). The as reserved plete and
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter  NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign is rather general,	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discrete factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice learning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the be BI-IOS.  Modern Object-Oriented Programming in Pharo gramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development not made in the programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or the semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analystation. The third large topic is computer arithmetics and number representation in a computer along with error ma	particular, the course logarithm. The production of the production	se focuses roblem of  5 ementation. erience real port.  4 nners class  4 abstraction ementation interest. In cts and OO onsortium.  7 ation and d numerical mentation.  2 7 carried out he external nulare). The as reserved plete and
NI-MLP Applying machine I The course guides data process NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter  NI-MPI The course comp multi-variate integra algorithm and thei  NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign is rather general,  NI-MSI Mathematical se	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In a fostoring a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the beaton of the modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development main gobject programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or mas of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Mathematics for Informatics  Mathematics for Informatics  Material Psychology  Master Project  Got the semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide on partial tas: If the requirements they agreed upon are met, the supervisor award	particular, the course logarithm. The production of the production	se focuses roblem of  5 ementation. erience real port.  4 nners class  4 abstraction ementation interest. In cts and OO onsortium.  7 ation and d numerical mentation.  2 7 carried out he external nulare). The as reserved plete and
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei NI-MPL NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign is rather general,  NI-MSI Mathematical se	Mathematics for Cryptology deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In job foolving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sisting and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the boundary of the most widespread paradigms of software creation, especially enterprise information systems, where in plex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development now ingo of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  Mathematics for Informatics  Mathematics for Informatics  Prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analys ation. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last top or stability analysis. The topics are completed with demonstration of applications in computer science. The course focu	particular, the course logarithm. The properties of the properties	se focuses roblem of  5 ementation. erience real port.  4 abstraction ementation interest. In cts and OO onsortium.  7 ation and d numerical imentation.  2 7 carried out the external nulare). The as reserved plete and  4 calculus.
Students will gain on the problem of	deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In jot solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice  aerning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically is sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications  the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the be Bi-IOS.    Modern Object-Oriented Programming in Pharo gramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in pipex modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development ing object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or most of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics  prises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analysation. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last	particular, the course logarithm. The production of the production	se focuses roblem of  5 ementation. erience real port.  4 abstraction ementation interest. In cits and OO onsortium.  7 ation and d numerical imentation.  2 7 carried out the external rulare). The as reserved plete and  4 calculus.  5 riented on
NI-MLP Applying machine I The course guides data proces NI-MMA Students will learn  NI-MOP Object-oriented pro is used to build com of object systems addition to deepen technologies in ter NI-MPI The course comp multi-variate integra algorithm and thei NI-MPR 1. At the beginning during the semeste supervisor enters t completed and sign is rather general,  NI-MSI Mathematical se  NI-MTI SYNOPSIS The s TCP/IP is able to complete on the semeste supervisor enters the complete of the semeste supervisor enters the semeste supervisor enter	deeper knowledge of algebraic procedures solving the most important mathematical problems concerning the security of ciphers. In jot solving a system of polynomial equations over a finite field, the problem of factorization of large numbers and the problem of discret factorization will also be solved on elliptic curves. Students will further become familiar with modern encryption systems based on Machine Learning in Practice earning methods to real projects in practice involves many other necessary tasks - from understanding the intentions of the client to, ide students through all phases of a project according to the standard CRISP-DM methodology, not only theoretically but also practically sing and learn how to describe the whole process from exploration to evaluation of the model performance in the form of a clear and Multiplatform development of mobile applications the latest trends in mobile development technologies for iOS platform. Class covers advanced topics, students need to know all the brail-IOS.    Modern Object-Oriented Programming in Pharo agramming is currently one of the most widespread paradigms of software creation, especially enterprise information systems, where in modern applications. In this course, we build on the knowledge acquired in the course BI-OOP and aim to further deepen the skills in modern pure object system Pharo (https://pharo.org). The course focuses on individual approach to students, their development ming object programming skills, which are generally applicable in other OO languages, students will also gain the opportunity to work or mas of semestral work with the possibility of cooperation with practice and related bachelor, diploma, postgraduate our direct involvem Mathematics for Informatics    Mathematics for Informatics   Mathematics for Informatics   Mathematics for Informatics   Mathematics   Mathematica   Psychology   Mathematica   Psychology   Mathematica   Psychology   Mathematica   Psychology   Mathematica   Psychology   Mathematica   Psychology   Mathematica	particular, the course logarithm. The production of the production	se focuses roblem of  5 ementation. erience real port.  4 nners class  4 abstraction ementation interest. In cits and OO onsortium.  7 ation and d numerical mentation.  2 7 carried out he external nulare). The as reserved plete and  4 calculus.  5 riented on e seamless

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 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-MZI Mathematics for data science Z,ZK In this course, students are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in data science. The studied topics include mainly: linear algebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principle, gradient methods) and selected notions from probability theory and statistics. NI-NLM Neural Language Models 5 In this course, students will learn the technical foundations of the Transformer architecture as well as the practical aspects of using language models. The goal of the course is to teach students how to use language models to solve problems, make informed risk assessments, and work critically with the scientific literature Neural Networks, Machine Learning and Randomness NI-NMS Z.ZK 4 Stochastic methods, i.e. methods based on randomness, are extremely important for the construction and training of neural networks as well as a number of other machine learning models. The course "Neural networks, machine learning and randomness" will discuss in sufficient depth a number of specific types of neural networks that rely substantially on randomness, as well as a number of specific stochastic methods for neural networks and machine learning. In the final two topics, it explains the general stochastic approach to training neural networks and shows that, in addition to the use of randomness in neural networks and machine learning, machine learning models, including neural networks, are used in one of the most important applications of randomness stochastic optimization methods, which include e.g. popular evolutionary algorithms. NI-NMU New media in art and design ZK 3 The course introduces students to the issue of using new media in artistic and design work. Key topics are moving image, internet, computer game and sound. The main goal is to familiarize the student with the largest possible range of creative approaches in new media. The subject emphasizes dialogue with students, especially in lectures devoted to specific art projects. NI-NON Nonlinear Continuous Optimization and Numerical Methods 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-NSS Normalized Software Systems Students will learn the foundations of normalized systems theory that studies the evolvability of modular structures based on concepts from engineering, such as stability from system theory and entropy from thermodynamics. Students will understand a set of principles that indicate where violations of stability and entropy-related issues occur in any given software architecture. In the second part of the course, students learn how to construct software architectures using 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 handling violations of the stability and entropy-related principles. This knowledge allows students to realize new levels of evolvability in software architectures. NI-NUR Z,ZK User Interface Design 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. Linux Drivers The Linux operating system is an important operating system for personal computer and also for embedded systems. Systems on chip and combining powerful processors and FPGAs increase the variability of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver development for master's students. The course provides knowledge of Linux operating system architecture, principles of development of various types drivers, including practical experience. NI-OSY Operating Systems and Systems Programming 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-PAM Efficient Preprocessing and Parameterized Algorithms Z,ZK There are many optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necessary to solve these problems exactly in practice. We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one can find a common property (parameter) of the inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponentially in this (small) parameter and polynomially in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time preprocessing of the input, which is not possible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution method. We will present a plethora of parameterized 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 will also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation schemes. NI-PAS Advanced Aspects of Business 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 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** 7.7K 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-PDP Parallel and Distributed Programming 7.7K 21st century in computer architectures is primarily influenced by the shift of the Moore's law into parallelization of CPUs at the level of computing cores. Parallel computing systems are becoming a ubiquitous commodity and parallel programming becomes the basic paradigm of development of efficient applications for these platforms. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnection networks and collective communication operations, and languages and environments for parallel programming of shared and distributed memory computers. They get acquianted with fundamental parallel algorithms and on selected problems, they will

learn the technique	es of design of efficient and scalable parallel algorithms and methods of performance evaluation of their implementations. The course practical programming in OpenMP and MPI for solving a particular nontrivial problem.	includes a semest	er project of
NI-PG1	Computer Grafics 1	ZK	4
	on graphic courses (mainly BI-PGA and BI-PGR) and the knowledge from these courses is deepened by state-of-the-art knowledge.Th	_	
	iced computer graphics. Students will gain practical knowledge with realistic texturing and raytracing methods. An integral part of the cubsequent implementation. The course will be followed by a course PG2 supplementing the knowledge of PG1 on other areas and		
NI-PIS	Enterprise Information Systems	Z,ZK	5
	sed on the current IT requirements of large companies in the Czech Republic (Top 100). The basis is Data management, storage of bi	. ' .	
	telligence). The principles of solving the overall architecture of information systems in the banking, insurance and telecommunications		
	thermore, students will get acquainted with the life cycle of information systems in the company / organization and its impact on the bus quainted with technologies that have proven themselves in the elimination of basic risks in the planning, implementation and operation company / organization.		
NI-PIV	Computer Vision	Z,ZK	5
	on course focuses on the theoretical and practical mastery of modern methods and algorithms in the field of image data processing.St		uainted with
	les of computer vision, gradually move to advanced computer vision techniques using deep learning. Emphasis is placed on theoretic	-	
	ns and implementation of learned methods during exercises. Topics covered include morphological operations, image filtering, color re nd segmentation through classical and recent approaches based on deep learning, deep neural networks for computer vision (includi motion detection, visual expressiveness (saliency).	-	
NI-PLS1	Programming Language Seminar	Z	2
-	g Language Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which		
about programming	g languages and related fields. Participating students are expected to present a paper of their interest and actively participate in the d is a joint venue between FIT and MFF CUNI. It is open to all students and researchers interested in programming language		ading group
NI-PLS2	Programming Language Seminar	z Z	2
	g Language Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which	_	
about programming	g languages and related fields. Participating students are expected to present a paper of their interest and actively participate in the d		ading group
5. 6.	is a joint venue between FIT and MFF CUNI. It is open to all students and researchers interested in programming language		
NI-PLS3	Programming Language Seminar	Z Z	2
	g Language Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which g languages and related fields. Participating students are expected to present a paper of their interest and actively participate in the d		
	is a joint venue between FIT and MFF CUNI. It is open to all students and researchers interested in programming language		g g
NI-PLS4	Programming Language Seminar	Z	2
-	g Language Seminar aims to introduce students to research in programming languages. It has the format of a reading group in which		
about programming	g languages and related fields. Participating students are expected to present a paper of their interest and actively participate in the d is a joint venue between FIT and MFF CUNI. It is open to all students and researchers interested in programming language		ading group
NI-PON	Selected Topics in Optimization and Numerical mathematics	s. Z,ZK	5
_	s on optimization problems that appear in the field of machine learning and artificial intelligence. Students broaden their knowledge of co		-
in the course Mathe	ematics for informatics. The methods are explained and described along with the details on how they are implemented on computers	. Hence, the releva	nt concepts
	of numerical matematics, mainly numerical linear algebra, are explained too.		
NI-PSD	Public Services Design  oduce students to specifics of UX, Service design and development for public sector. We will look into the design and development p	KZ	4
	and designesr) as well as clients. In small teams students will work on projects from partner organizations and will try out collaboration		
	Course is aimed at students-designers as well as clients.		
NI-PSL	Programming in Scala	Z,ZK	4
	uces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language feature ibrary. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks and Scalaz, etc.	<del>-</del> ·	-
NI-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		
-	s students to their application in virtual reality. Lectures will focus on virtual reality technology, its use in various applications and will also	_	
in available 3D eng	ines (mainly Unity3D). The course is freely connected with the subject VHS (virtual game worlds), students will be able to apply the kn in virtual reality, or directly create a complex game for VR.	lowledge gained in	this subject
NI-PVS	Advanced embedded systems	Z,ZK	4
	ised on ARM processors and microcontrollers and their usage in wide range of applications. The course includes a series of advance		
working with mass	s storage devices, motor control, system control and industrial communication. The students obtain both theoretical and also practical	l experiences with	embedded
NU DVC	systems.		
NI-PYT	Advanced Python urse is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Python	KZ	4
-	it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral coursework.		
	teachers from Red Hat.		
NI-REV	Reverse Engineering	Z,ZK	5
_	equainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens before the control of the co		
	will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is dedicate in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be do	_	- 1
	ebugging work and which methods can be used to detect it. One of the lectures will be dedicated to the latest trends on the computer		
	the course is on the seminars, where students will solve practically oriented tasks from the real world.		
NI-ROZ	Pattern Recognition	Z,ZK	5
	nodule is to give a systematic account of the major topics in pattern recognition with emphasis on problems and applications of the st		-
NI-RUB	Idents will learn the fundamental concepts and methods of pattern recognition, including probability models, parameter estimation, an	KZ	aspects.
MI-LOD	Programming in Ruby This course is presented in Czech.	1\L	4

NI-RUN Runtime Systems Z,ZK 5 This course is an introduction to the world of virtual machines (VM) for high-level programming languages. There are two goals: Give you hands-on experience in design and implementation of a compiler and a VM from scratch, including Abstract Syntax Tree (AST) interpretation Byte code (BC) design and interpretation AST to BC compilation Memory management Just-in-time compilation and some optimization techniques Through a series of guest lectures, introduce you to various advanced topics and implementations of real-world VMs, including Dynamic optimizations, speculations, and deoptimizations Language implementation frameworks Read-world VMs 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). Computer Engineering Seminar Master I The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to failures and attacks. Students are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is work with scientific articles and other professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each semester. NI-SCE2 Computer Engineering Seminar Master II The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to failures and attacks. Students are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is work with scientific articles and other professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each semester. NI-SCR Statistical Analysis of Time Series Z,ZK 5 The course deals with the practical use of the basic time series modelling theory in engineering tasks, ranging from economics (stock exchange prices, employment) and industrial problems (modelling of signals and processes) to computer networks (network components load, attacks detection). The students learn to select a convenient process model, estimate its parameters, analyze its properties and use it for forecasting of future or intermediate values. The stress is put on understanding and adoption of the main principles based on practical real-world examples. Both the lab classes and the lectures exploit freely available software packages in order to provide easy and straightforward transfer of students' knowledge from the academic to the real world. NI-SEP World Economy and Business Z,ZK This course is presented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of technical university to the international business. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. NI-SIB **Network Security** Z,ZK NI-SIM Digital Circuit Simulation and Verification Z.ZK 5 The aim of the course is to acquaint the students with principles of digital circuit simulation at RTL (Register Transfer Level) and TLM (Transaction Level Modeling) levels and with the properties of proper tools. The course covers recent verification methods, too. NI-SWE Semantic Web and Knowledge Graphs Z,ZK 5 The students will learn the most recent concepts and technologies of the Semantic Web. The course will provide an overview of the Semantic Web technologies, methods and best practices for modelling, integration, publishing, querying and consumption of semantic data. The students will also gain skills in creation of knowledge graphs and their systematic quality assurance. 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 of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing. Knowledge Engineering Seminar Master I 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). NI-SZ2 Knowledge Engineering Seminar Master II 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 AI conferences and summer schools, as well as FIT's own Summer Research Program (VyLet). NI-TES Systems Theory Z,ZK 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. NI-TKA **Category Theory** Z.ZK NI-TNN Theory of Neural Networks 7.7K Artificial neural networks are now the foundation of artificial intelligence and the fastest-growing area of machine learning. This course introduces their theoretical foundations. It begins with general conceptsstructure, active dynamics, and adaptive dynamics (i.e., learning). Then it covers the theoretical basis of the most common types of artificial neural networks, from the perceptron of the 1950s to the transformer of 2017. Finally, using function approximation theory, it rigorously explains the most important theoretical result: the universal approximation capability of neural networks. NI-TNN.25 Theory of Neural Networks Z,ZK Artificial neural networks are now the foundation of artificial intelligence and the fastest-growing area of machine learning. This course introduces their theoretical foundations. It begins with general concepts structure, active dynamics, and adaptive dynamics (i.e., learning). Then it covers the theoretical basis of the most common types of artificial neural networks. from the perceptron of the 1950s to the transformer of 2017. Finally, using function approximation theory, it rigorously explains the most important theoretical result: the universal approximation capability of neural networks. NI-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.

NI-TS2	Theoretical Seminar Master II	Z	4
	ar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical		
are treated individ	ually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a w other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.	ork with scientifi	ic papers and
NI-TS3	Theoretical Seminar Master III	Z	4
	ar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical		1
	ually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a w		
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.		
NI-TS4	Theoretical Seminar Master IV	Z	4
	ar is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classical		1
are treated individ	ually and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a w	ork with scientifi	ic papers and
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.		
NI-TSP	Testing and Reliability	Z,ZK	5
_	knowledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to prep		=
the intuitive path s	ensitization and to use an ATPG for automatic test generation. They will be able to design easily testable circuits and systems with buil	t-in-self-test equ	iipment. They
	will be able to compute, analyze, and control the reliability and availability of the designed circuits.		<del>.</del> .
NI-TSW	Software Product Development	KZ	4
NII TVD	The course is presented in Czech.	7 71/	
NI-TVR	Virtual Reality Technology	Z,ZK	3
	ntroduced to the basic concepts of virtual reality. Techniques for displaying virtual worlds (CAVE, HMD,) and the possibilities of contri acking, eye tracking) will be discussed. Furthermore, the concepts of mixed and augmented reality will be introduced. Finally, ways of u	_	
tracking, frame to	reality will be presented.	ising virtual and	augmenteu
NI-UMI	Artificial intelligence	Z.ZK	5
	s search and inference algorithms in major formal paradigms used in artificial intelligence such as logic theories, constraint programm	,	-
	The main principles and practical applications of discussed techniques will be illustrated.		p
NI-VCC	Virtualization and Cloud Computing	Z,ZK	5
	in knowledge of architectures of large computer systems that are used in data centers and computer infrastructure of companies and	•	1
acquainted with v	irtualization principles, tools and technologies that serve to facilitate and automate configuration, testing and monitoring, and to efficien	ntly operate and	optimize the
performance pa	arameters of modern computer systems. Theoretically and practically, they will get acquainted with containerization as the most effective	e technology to	day for the
management of co	mplex computer systems and with specific technologies of cloud systems. Finally, they will learn the principles and gain practical skills in	the use of mode	rn integration
	and development tools (Continuous integration and development).		
NI-VEM	Scientific thinking	KZ	2
	the course is to get acquainted with scientific methods and discovery of order and laws of the universe, including the aspects of huma	n lite. The subied	ct combines
aniantifia mathad	a in natural asigness, mathematics, computer asignes and humanities. Another aim is to introduce vulce and requirements of asigntific	=	via raaaarah
scientific method	s in natural sciences, mathematics, computer science and humanities. Another aim is to introduce rules and requirements of scientific	=	via research
	papers and posters.	communication	
NI-VGA	papers and posters.  Video Games Architecture	z,ZK	5
NI-VGA The course cover	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view	Z,ZK v, but also from a	5 a design and
NI-VGA The course cover philosophical point	papers and posters.  Video Games Architecture	Z,ZK v, but also from a	5 a design and ture typical of
NI-VGA The course cover philosophical point	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fur	Z,ZK v, but also from a	5 a design and ture typical of
NI-VGA The course cover obilosophical point	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fur t, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in	Z,ZK v, but also from a	5 a design and ture typical of
NI-VGA The course cover philosophical point game developmen	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.	Z,ZK v, but also from a nectional architecticulating ways of	5 a design and ture typical of implementing
NI-VGA The course cover philosophical point game developmen NI-VMM The student obtain	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.	Z,ZK w, but also from a nectional architecticular ways of Z,ZK ure extraction fro	5 a design and ture typical of implementing 5 m multimedia
NI-VGA The course cover philosophical point game developmen	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fur t, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections	Z,ZK v, but also from a nectional architecticulating ways of	5 a design and ture typical of implementing
NI-VGA The course cover philosophical point game developmen NI-VMM The student obtain	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.	Z,ZK w, but also from a nectional architecticular ways of Z,ZK ure extraction fro	5 a design and ture typical of implementing 5 m multimedia
NI-VGA The course cover philosophical point game developmen NI-VMM The student obtain	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to five to five. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project	Z,ZK w, but also from a nectional architecticular ways of Z,ZK ure extraction fro	5 a design and ture typical of implementing 5 m multimedia
NI-VGA The course cover philosophical point game development NI-VMM The student obtain NI-VOL NI-VPR	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to five. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.	Z,ZK w, but also from a nectional architect cluding ways of Z,ZK ure extraction fro	5 a design and ture typical of implementing 5 m multimedia 5
NI-VGA The course cover obilosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to five to five. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.	Z,ZK w, but also from a notional architect cluding ways of Z,ZK ure extraction fro Z,ZK Z Z,ZK	5 a design and ture typical of implementing 5 m multimedia 5
NI-VGA The course cover obilosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM The course leads	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to five to five. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multiplayer.	Z,ZK w, but also from a notional architect cluding ways of Z,ZK ure extraction fro Z,ZK Z Z,ZK	5 a design and ture typical of implementing 5 m multimedia 5
NI-VGA The course cover philosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM The course leads	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to five to five. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multiropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand	Z,ZK w, but also from a notional architect cluding ways of Z,ZK ure extraction fro Z,ZK Z Z,ZK	5 a design and ture typical of implementing 5 m multimedia 5
NI-VGA The course cover obilosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM The course leads application of en	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furth, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with muttropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.	Z,ZK w, but also from a notional architect cluding ways of the street of	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, iith focus on
NI-VGA The course cover obilosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM The course leads	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multiply in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability	Z,ZK w, but also from a notional architect cluding ways of Z,ZK ure extraction fro Z,ZK Z Z,ZK	5 a design and ture typical of implementing 5 m multimedia 5
NI-VGA The course cover obilosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM The course leads application of en	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with must tropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.	Z,ZK w, but also from a notional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 7 distribution, iith focus on 4
NI-VGA The course cover chilosophical point game development of the student obtain of the student obtain of the student obtain of the student obtain of the course leads application of en on the student of the student obtain obta	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multipropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits	Z,ZK v, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, iith focus on 4
NI-VGA The course cover chilosophical point game development NI-VMM The student obtain NI-VOL NI-VPR NI-VSM The course leads application of en NI-VYC NI-ZS10 Each student can	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multiropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institut	Z,ZK w, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 7 distribution, ith focus on 4 10 nternship the
NI-VGA The course cover chilosophical point game development of the student obtain of the student obtain of the student obtain of the student can be an of the FIT, or	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feature objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multipropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits	Z,ZK w, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary
NI-VGA The course cover obiliosophical point game development of the student obtain of the student obtain of the student obtain of the student can of the student can occurse MI-ZS10, courses MI-ZS10, occurses MI-ZS10, occurses MI-ZS10, occurses over the student can occurse over the student can occur occurs over the student can occur occ	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fur t, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feats objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods  the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with muttropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits 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 extended the course of the professional cont	Z,ZK w, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary loyment with
NI-VGA The course cover obilosophical point pame development of the student obtain of the student of the student can of the FIT, or courses MI-ZS10, a foreign instituti	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fut t, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feater objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multipropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits  once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institute vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extent of the maximum number of credits a student can earn for one internship in 1S KOS. Every 10 credits correspond to 4 weeks on. The maximum number of credits a student can earn for one internship in 1S KOS. Every 10 credits content and extents aca	Z,ZK w, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5
NI-VGA The course cover obiliosophical point game development of the student obtain of the student of the student can obtain obta	Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to five. In the lectures, students will be guided through the history of development, the structure of game engines, component and fur t, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with muttropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits 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 ext MI-ZS20, MI-ZS30 are used used for the evidence and evaluation of the internship in 1S 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 in a	Z,ZK v, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, rith focus on 4 10 nternship the ship. Auxiliary oloyment with exceeds the 20
NI-VGA The course cover obilosophical point game development of the student obtain of the student of the student can obtain of the FIT, or courses MI-ZS10, a foreign institution of the student can obtain obt	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view to foview. In the lectures, students will be guided through the history of development, the structure of game engines, component and fut to, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with mutropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits  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	Z,ZK w, but also from a actional architected architect	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary oloyment with exceeds the 20 nternship the
NI-VGA The course cover chilosophical point game development of the student obtain of the student obtain of the student obtain of the student obtain of the student can of the FIT, or courses MI-ZS10 Each student can of the FIT, or courses MI-ZS10, a foreign institution of the FIT, or course of the FIT, or c	papers and posters.  Video Games Architecture  s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fut the physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia  s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feat objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods  It he student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with mutropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits  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 extended in the professional content and e	Z,ZK  w, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary
NI-VGA The course cover chilosophical point game development of the student obtain of the student can obtain obta	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feat objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods  the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with mutropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits 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 extince of the professional content and extince of the evidence and evaluation of the internship in 1S KOS. Every 10 credits correspond to 4 weeks on. The maximum number of credits a student can earn for one internship in a foreign university or other foreign sc	Z,ZK  w, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with
NI-VGA The course cover obiliosophical point game development of the student obtain of the student can obtain of the FIT, or courses MI-ZS10, a foreign institution of the FIT, or courses MI-ZS20 Each student can obtain of the FIT, or courses MI-ZS20 Each student can obtain of the FIT, or courses MI-ZS10, a foreign institution of the FIT, or courses MI-ZS10, courses MI-ZS10, courses MI-ZS10,	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with multropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits 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 extinct the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extinct which has / her master's degree have a foreign internship at a foreign university or other foreign sci	Z,ZK  w, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with
NI-VGA The course cover obiliosophical point game development of the student obtain of the student can obtain of the FIT, or courses MI-ZS10, a foreign institution of the FIT, or courses MI-ZS20 Each student can obtain of the FIT, or courses MI-ZS10, a foreign institution of the FIT,	Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fut t, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feat objects, indexing, and structure of distributed search engines.  Elections We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with mutropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits 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 extending the processional content and extending a process of the professional content and extending a professional content and ex	Z,ZK  v, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the
NI-VGA The course cover chilosophical point game development of the student obtain of the student can obtain o	Video Games Architecture  s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia  s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods  the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with muttropy in coding theory, thypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits  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 extended in the processional content and extended in the processional content and extended in the processional content and extended in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extende	Z,ZK  v, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 30
NI-VGA The course cover obiliosophical point game development of the student obtain of the student of the student can obtain ob	papers and posters.  Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fut, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods  the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with mutropy in coding theory, hypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits  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 extended in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extended in the vice-dean for study affairs assesses the professional content. The student must provide evidence o	Z,ZK  v, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 30 entific and/or
NI-VGA The course cover obiliosophical point game development of the student obtain of the student of the student can obtain ob	Video Games Architecture  s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and furt, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.  Retrieval from Multimedia  s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feating objects, indexing, and structure of distributed search engines.  Elections  We will cover the basics of (committee) elections and, in general, opinion aggregation.  Research Project  Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.  Selected statistical Methods  the student through advanced probabilistic and statistical methods used in information technology praxis. Particularly it deals with muttropy in coding theory, thypothesis testing (T-tests, goodness of fit tests, independence test). Second part of the course deals with rand Markov chains. The high point of the course is the Queuing theory and its application in networks.  Computability  Classical theory of recursive functions and effective computability.  Master internship abroad for 10 credits  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 extended in the processional content and extended in the processional content and extended in the processional content and extended in the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and extende	Z,ZK  v, but also from a actional architect cluding ways of a cluding ways of a cluding ways of a z,ZK  ure extraction from z,ZK  Z,ZK  Z,ZK  Itivariate normal for processes was z,ZK  Z ion. Before the internst of full-time empt of the internship	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 30 entific and/or exprofessional
NI-VGA The course cover chilosophical point game development of the student obtain of the student can obtain obt	Video Games Architecture s a wide range of topics, procedures and methodologies related to the development of computer games - from a technical point of view. In the lectures, students will be guided through the history of development, the structure of game engines, component and fut, physics, graphics, artificial intelligence and multiplayer. The exercises will then cover selected technological topics in greater detail, in some game mechanics, in the form of practical demonstrations.    Retrieval from Multimedia   Retrieval from Multimedia	Z,ZK  y, but also from a actional architected architec	5 a design and ture typical of implementing 5 m multimedia 5 5 7 distribution, ith focus on 4 10 nternship the ship. Auxiliary olloyment with exceeds the 20 nternship the ship. Auxiliary olloyment with exceeds the 30 entific and/or exprofessional ts correspondiate correspondiates correspondiates.

NIE-BLO Blockchain Z,ZK 5 Students will understand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platforms. They will be able to design, code and deploy a secure decentralized application, and assess whether integration of a blockchain is suitable for a given problem. The course places an increased emphasis on the relationship between blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the students for implementing or supervising implementation of blockchain-based solutions in both academia and business. NIE-PDL Practical Deep Learning 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, 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. Personalized Machine Learning 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 entities. While PML is commonly used in applications such as recommender systems, which recommend items to users based on their personal interests, its principles can be applied to a wide range of other fields, including education, medicine, and chemical engineering. In this course, we will explore the latest PML methods from theoretical, algorithmic, and practical perspectives. Specifically, we will focus on cutting-edge models that are of interest to both the research and commercial communities. PI-SCN Seminars on Digital Design ZK 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 optimization algorithms are described. Basics of EDA (Electronic Design Automation) systems are given, together with combinatorial problems emerging in EDA.

For updated information see <a href="http://bilakniha.cvut.cz/en/FF.html">http://bilakniha.cvut.cz/en/FF.html</a> Generated: day 2025-11-20, time 19:35.