Recomended pass through the study plan

Name of the pass: Master program Informatics, unspecified branch, in Czech, version 2016-2019

Faculty/Institute/Others:

Department:

Pass through the study plan: Master program Informatics, unspecified branch, in Czech, version 2016-2019 Branch of study guranteed by the department: Welcome page

Guarantor of the study branch:

Program of study: Informatics, valid until 2024

Type of study: Follow-up master full-time

Note on the pass: Spole ný magisterský plán p ed p i azením do oboru, verze 2016-2019.

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
MI-MPI	Mathematics for Informatics Št pán Starosta	Z,ZK	7	3P+2C	Z	PP
MI-PAA	Problems and Algorithms Petr Fišer	Z,ZK	5	2P+1R+1C	Z	PP
MI-PO_PZ.2017	Oborové p edm ty všech obor v etn povinných p edm t zam ení MI-ADM.16,MI-ADP.16, (see the list of groups below)		Min/Max 0/			VO
MI-V.2017	ist volitelné magisterské p edm ty, verze 2017 MI-IKM,MI-AFP, (see the list of groups below)	Min. cours. 0	Min/Max 0/0			V

Number of seme	ster: 2					
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
MI-PDP.16	Parallel and Distributed Programming	Z,ZK	5	2P+2C	L	PP
MI-SPI.16	Statistics for Informatics	Z,ZK	7	4P+2C	L	PP
MI-PO_PZ.2017	Oborové p edm ty všech obor v etn povinných p edm t zam ení MI-ADM.16,MI-ADP.16, (see the list of groups below)		Min/Max 0/			VO
MI-V.2017	ist volitelné magisterské p edm ty, verze 2017 MI-IKM,MI-AFP, (see the list of groups below)	Min. cours. 0	Min/Max 0/0			V

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
MI-MPR	Master Project	Z	7		Z,L	PP
MI-PO_PZ.2017	Oborové p edm ty všech obor v etn povinných p edm t zam ení MI-ADM.16,MI-ADP.16, (see the list of groups below)		Min/Max 0/			VO
MI-PV-EM.2016	Povinn volitelné magisterské ekonomicko manažerské p edm ty, verze 2016 FI-VEZ,MI-IBE, (see the list of groups below)	Min. cours. 1 Max. cours. 2	Min/Max 2/6			VE

MI-V.2017	ist volitelné magisterské p edm ty, verze 2017	Min. cours.	Min/Max	N
1011-0.2017	MI-IKM,MI-AFP, (see the list of groups below)	0	0/0	V

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
MI-DIP	Diploma Project	Z	23		L,Z	PP
MI-PV-HU.2016	Povinn volitelné magisterské humanitní p edm ty, verze 2016 NI-CAP,FI-FIL, (see the list of groups below)	Min. cours. 1 Max. cours. 2	Min/Max 3/6			VH
MI-V.2017	ist volitelné magisterské p edm ty, verze 2017 MI-IKM,MI-AFP, (see the list of groups below)	Min. cours.	Min/Max 0/0			V

List of groups of courses of this pass with the complete content of members of individual groups

Kód		Name of the group o group (for specificati	f courses and on see here o	codes of members of this r below the list of courses)	Completion	Credit	s Scope	Semester	Role
MI-PO_P	Z.2017			etn povinných p edm t		Min/Ma 0/			vo
MI-ADM.16	Data Minir	ng Algorithms	MI-ADP.16	Architecture and Design Patterns	MI-AVY	/	Automata in T	ext Pattern Mate	chin
MI-BPR	Security a	nd Secure Programming	MI-BHW.16	Security and Hardware	MI-BKO.	16 E	Error Control	Codes	
MI-DSV.16	Distributed	Systems and Computin	MI-DDW.16	Web Data Mining	MI-FME.	16 F	ormal Metho	ds and Specific	ation
MI-FLP	Functional	and Logical Programmi	MI-GEN	Code Generators	MI-HWB	.16 I	Hardware Sec	curity	
MI-KOD.16	Data Com	pression	MI-MKY.16	Mathematics for Cryptology	MI-MVI.	16 (Computationa	I Intelligence M	etho
MI-MEP.16	Modelling	of Business Processes	MI-MTI.16	Modern Internet Technologies	MI-NFA.	16 [Design for the	FPGA and AS	IC Tec
MI-NUR.16	User Inter	face Design	MI-NSS.16	Normalized Software Systems	MI-PAP.1	6 F	Parallel Comp	uter Architectur	es
MI-EDW.16	Enterprise	Data Warehouse System	MI-PAL	Advanced Algorithms	MI-KRY.	16 /	Advanced Cry	ptology	
MI-POA.16	Advanced	Computer System Archit	MI-PDB.16	Advanced Database Systems	MI-PIS.1	6 /	Advanced Info	rmation System	ns
MI-PCM.16	Project An	d Change Management	MI-PDD.16	Data Preprocessing	MI-REV.	16 F	Reverse Engi	neering	
MI-MBI.16	Managem	ent of Business Informati	MI-SWE.16	Semantic Web	MI-SIB.1	1 0	Network Secu	rity	
MI-SMI.16	Strategic N	Management of Informat	MI-SYP.16	Parsing and Compilers	MI-SYB.	16 \$	System Secu	ity	
MI-SOC.16	Systems of	on Chip	MI-CPX	Complexity Theory	MI-TES.	16 5	Systems Theo	ory	
MI-TSP.16	Testing an	d Reliability	MI-UMI	Artificial intelligence	MI-VMM	.16 F	Retrieval from	Multimedia	
MI-W20.16	Web 2.0		MI-MDW.16	Web Services and Middleware					

MI-PV-EI	M.2016	Povinn volitelné r p	nagisterské edm ty, ve	ekonomicko manažerské rze 2016		cours. 1 cours. 2	Min/N 2/6			VE
FI-VEZ	economic-	managerial course from	MI-IBE	Information Security		MI-MPX	1	Manage	ment practice	I
MI-PCM.16	Project And	d Change Management	MI-SEP	World Economy and Business						
MI-PV-H	U.2016	Povinn volitelné m	agisterské 2016	humanitní p edm ty, verze		cours. 1 . cours.	Min/W 3/6			νн
NI-CAP	Cultural an	d Social Anthropology	FI-FIL	Philosophy		2 MI-HMI2		History	of Mathematics	and Infor
FI-HTE		Fechnology and Econom	FI-HPZ	Humanities subject from a study		MI-KYB.		Cyberna		
FI-MPL		l Psychology	FI-KSA	Cultural and Social Anthropology	-	FI-ULI		,	tion to Linguisti	cs for
MI-V.2	2017	ist volitelné	magisterské	p edm ty, verze 2017	Min.	cours. 0	Min/W 0/0			v
MI-IKM	Internet an	d Classification Meth	MI-AFP	Applied Functional Programming		MI-APH		Architec	ture of compute	r games
MI-BML	Bayesian N	Nethods for Machine Lea	MI-BPS	Wireless Computer Networks		MI-DSP		Databas	se Systems in P	ractes
MI-DZO	Digital Ima	ge Processing	MI-DDM	Distributed Data Mining		MI-PAM		Efficient	Preprocessing	and Para
MI-GLR	Games and	d reinforcement learning	NI-HSC	Side-Channel Analysis in Hardwar	ſ	MI-HMI2		History of	of Mathematics	and Infor
MI-IVS	Intelligent e	embedded systems	NI-IAM	Internet and Multimedia		MI-IOT		Internet	of Things	
MI-ATH	Combinato	rial Theories of Games	NI-CCC	Creative Coding and Computation	а	NI-LSM		Statistica	al Modelling Lal	b
MI-LOM.16	Linear Opt	imization and Methods	MI-MSI	Mathematical Structures in Compu	J	MI-MZI		Mathem	atics for data so	cience
NI-MOP	Modern Ob	ject-Oriented Programmi	MI-MPC	Modern programming in C ++		MI-MAI		Multime	dia and Internet	
MI-OLI	Linux Drive	ers	MI-ARI	Computer arithmetic		NI-PG1		Compute	er Grafics 1	

MI-PVR	Advanced Virtual Reality	NI-AML	Advanced machine learning	MI-IOS	Advanced techniques in iOS appli
MI-PVS	Advanced embedded systems	MI-DNP	Advanced .NET	MI-PYT	Advanced Python
MI-PRC	Programming in CUDA	MI-PSL	Programming in Scala	MI-RUB	Programming in Ruby
MI-ROZ.16	Pattern Recognition	MI-RRI	Risk Management in Informatics	MI-SCE1	Computer Engineering Seminar Mas
MI-SCE2	Computer Engineering Seminar Mas	MI-SZ1	Knowledge Engineering Seminar Ma	PI-SCN	Seminars on Digital Design
MI-SCR	Statistical Analysis of Time Ser	BI-SOJ	Machine Oriented Languages	MI-TS1	Theoretical Seminar Master I
MI-TS2	Theoretical Seminar Master II	MI-TS3	Theoretical Seminar Master III	MI-TS4	Theoretical Seminar Master IV
MI-TNN	Theory of Neural Networks	MI-VEM	Scientific thinking	MI-MCS	Multicore Systems
MI-VYC	Computability	NI-VPR	Research Project	MI-ZS10	Master internship abroad for 10
MI-ZS20	Master internship abroad for 20	MI-ZS30	Master internship abroad for 30		

List of courses of this pass:

	Name of the course	Completion	Credits
BI-SOJ	Machine Oriented Languages	Z,ZK	4
Students of the co	irse will gain an ability to create their own programs in the assembly language of the most common PC platform focusing on optimal u	se of microprocess	or's features
and efficient coope	ration of software with hardware. Next, there will be discussed x86 specifics of the majority of OSes from the application point of view I	inked to higher leve	languages.
	This knowledge will be used during reverse engineering, optimization, and evaluation of code security.		
FI-FIL	Philosophy	ZK	2
	see A0B16		
FI-HPZ	Humanities subject from a study abroad	Z	3
A "Humanities su	ject that has been studied abroad" is covered by the Humanities subject from a study abroad in Compulsory Humanities Module that	at is required in the	curriculum.
	The substitution is approved by the Vice-Dean for study affairs on behalf of the Dean at the request of the student.		
FI-HTE	History of Technology and Economics	ZK	2
The course introdu	ces the scientific disciplines of history and technology, economic and social history of the Czech lands and Czechoslovakia in comp	parison with the dev	elopment of
	the European region 19 to 21 century .		
FI-KSA	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 diversi	-	
anthropological re	search from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, heal	th, history, death, e	tc) will be
	shown. The course is an interesting alternative to other humanities, taught at FIT.		
FI-MPL	Managerial Psychology	ZK	2
FI-ULI	Introduction to Linguistics for Computer	ZK	2
	This course is presented in Czech.		
FI-VEZ	economic-managerial course from a study abroad	Z	4
A "Humanities su	oject that has been studied abroad" is covered by the Humanities subject from a study abroad in Compulsory Humanities Module that	at is required in the	curriculum.
	The substitution is approved by the Vice-Dean for study affairs on behalf of the Dean at the request of the student.		
MI-ADM.16	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).		(e.g., kernei
MI-ADP.16	Architecture and Design Patterns	Z,ZK	5
-	is course is to provide students with both work knowledge about the underlying foundations of object-oriented design and analysis a		-
	ues, and tradeoffs of advanced software design. In the first part of the course, the students will refresh and deepen their knowledge of the commonly used object-oriented design patterns that represent the best practices for solving common software design problems.		•
-	the principles of software architecture design and analysis. This includes the classical architectural styles, component based system.		
will be introduced i	architectures used in large-scale distributed systems.	s, and some advanc	eu sonware
MI-AFP	Applied Functional Programming	KZ	5
	ented in Czech. Functional programming represents one of the traditional programming paradigms. Traditional and novel functional		-
	s and the functional paradigm becomes an important construct of traditionally imperative languages (C++, C#, Java). As such, maste		
the rise nowaday			becomes a
the rise nowaday	necessary competence of a software engineer: the theory and especially the practice.		becomes a
		1	4
MI-APH	Architecture of computer games	Z,ZK	4
MI-APH Students will gain		Z,ZK	4 t a grasp on
MI-APH Students will gain	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of	Z,ZK	4 t a grasp on
MI-APH Students will gain component-oriente	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfin and apply them in practical exercises (labs).	Z,ZK of view. They will ge nding, networking, a	4 t a grasp on nd scripting
MI-APH Students will gain	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfi	Z,ZK of view. They will ge nding, networking, a	4 t a grasp on
MI-APH Students will gain component-oriente MI-ARI	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfin and apply them in practical exercises (labs). Computer arithmetic Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementations	Z,ZK of view. They will ge nding, networking, a Z,ZK ation units.	4 t a grasp on nd scripting 4
MI-APH Students will gain component-oriente	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfin and apply them in practical exercises (labs). Computer arithmetic	Z,ZK of view. They will ge nding, networking, a	4 t a grasp on nd scripting
MI-APH Students will gain component-oriente MI-ARI MI-ATH	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfin and apply them in practical exercises (labs). Computer arithmetic Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementa Combinatorial Theories of Games This course is presented in Czech.	Z,ZK of view. They will ge nding, networking, a Z,ZK ation units. Z,ZK	4 t a grasp on nd scripting 4
MI-APH Students will gain component-oriente MI-ARI MI-ATH MI-AVY	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfin and apply them in practical exercises (labs). Computer arithmetic Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementations Combinatorial Theories of Games	Z,ZK of view. They will ge nding, networking, a Z,ZK ation units. Z,ZK Z,ZK	4 t a grasp on ind scripting 4 4 4
MI-APH Students will gain component-oriente MI-ARI MI-ATH MI-AVY Searching in a tex	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfin and apply them in practical exercises (labs). Computer arithmetic Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementa Combinatorial Theories of Games This course is presented in Czech. Automata in Text Pattern Matching	Z,ZK of view. They will ge nding, networking, a Z,ZK ation units. Z,ZK Z,ZK Z,ZK view.z,ZK Ve may interpret and	4 t a grasp on ind scripting 4 4 4 search the
MI-APH Students will gain component-oriente MI-ARI MI-ATH MI-AVY Searching in a tex data as one-dime	Architecture of computer games a basic understanding of the various issues in the field of computer game development, from both the technical and creative points of d architecture, game mechanics, and game AI that form an integral part of most games. They will also understand the basics of pathfil and apply them in practical exercises (labs). Computer arithmetic Students will learn various data representations used in digital devices and will be able to design arithmetic operations implementa Combinatorial Theories of Games This course is presented in Czech. Automata in Text Pattern Matching (pattern matching) and generally in data is an area of problems and exciting solutions from theoretical and practical perspectives. W	Z,ZK of view. They will ge inding, networking, a Z,ZK z,zk	4 t a grasp on ind scripting 4 4 d search the iknown (for

	Security and Hardware	Z,ZK	5
Students gain a bas	ic knowledge in selected topics of cryptography and cruptanalysis. The module focuses particularly on elliptic curve cryptography, an	d on contemporar	y attacks on
cryptographic syste	ms. Students gain a good overview of the functionality of (hardware) cryptographic accelerators, random number generators, smart car	ds, and resources	for securing
	of internal functions of computer systems.		1
MI-BKO.16	Error Control Codes	Z,ZK	5
_	of the course is to present various ways to detect or correct individual errors and burst errors in data stored into memories or transm		
MI-BML	Bayesian Methods for Machine Learning	KZ	5
	ed on practical use of basic Bayesian modeling methods in the dynamically evolving machine learning theory. In particular, it studies t		
	lescription of real phenomena, as well as their subsequent use, e.g., for forecasting of future evolution or learning about the hidden v		
-	ions etc.). The emphasis is put on understanding of explained principles and methods and their practical adoption. For this purpose, a r rill be presented to students, for instance, 2D/3D object tracking, radiation source term estimation, or separation in medical imaging.		-
and applications v	some of them.	The students will t	Ty to solve
MI-BPR	Security and Secure Programming	Z,ZK	4
	arn how to assess security risks and how to take them into account in the design phase of their own code and solutions. After getting fa		
	gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every		•
-	leges. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securing		
security and o	latabase systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the	e defense against	them.
MI-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, mu	lticast and
broadcast mechar	isms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowle	edge of security me	echanisms
	for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitab	le tools.	
MI-CPX	Complexity Theory	Z,ZK	5
Students will lear	about the fundamental classes of problems in the complexity theory and different models of algoritms and about implications of the	theory concerning	g practical
	(un)solvability of difficult problems.		
MI-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 o		
data processing fra	mework 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.		_
MI-DDW.16	Web Data Mining	Z,ZK	5
	n latest methods and technologies for Web data acquisition, analysis and utilization of the discovered knowledge. Students will gain		-
techniques for we	b crawling and search, Web structure analysis, Web usage analysis, Web content mining and information extraction. Students will als recent developments in the field of social web and recommendation systems.	so gain an overvie	W OI MOSI
MI-DIP		Z	23
MI-DIP MI-DNP	Diploma Project Advanced .NET	Z,ZK	
	ا a knowledge about advanced desgin of applicatios on a .NET platform. They gain skills of WPF (Windows Presentation Foundation		-
	mmunication Foundation) and Entity Framework. They are able to apply these skills on a development and desgin of advanced .NET		WINDOWS
MI-DSP	Database Systems in Practes	Z,ZK	4
	This course is presented in Czech.	2,210	
MI-DSV.16	Distributed Systems and Computing	Z,ZK	5
	ced to methods for coordination of processes in distributed environment characterised by nondeterministic time responses of computing	•	nmunication
channels. They lear	n basic algorithms that assure correctness of computations realized by a group of loosely coupled processes and mechanisms that s	processes and cor	
channels. They lear		processes and cor	
channels. They lear MI-DZO	n basic algorithms that assure correctness of computations realized by a group of loosely coupled processes and mechanisms that s	processes and cor	
MI-DZO	n 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.	processes and cor upport high availa Z,ZK	bility of both
MI-DZO This course prese implement and have	n 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. Digital Image Processing the a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical algorithms that is also an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is also	processes and cor upport high availal Z,ZK orithms that are bo so valuable outside	bility of both 4 oth easy to the domain
MI-DZO This course prese implement and have of digital image p	n 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. Digital Image Processing Ints a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical alg e an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is als rocessing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR	processes and cor upport high availal Z,ZK orithms that are be so valuable outside compression, de-b	bility of both 4 oth easy to the domain olurring in
MI-DZO This course prese implement and have of digital image p frequency domain,	n 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. Digital Image Processing as a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical algore an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is als rocessing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray conv	processes and cor upport high availal Z,ZK orithms that are be so valuable outside compression, de-t ersion, context en	4 oth easy to the domain olurring in hancement,
MI-DZO This course prese implement and have of digital image p frequency domain, interactive as-rig	n basic algorithms that assure correctness of computations realized by a group of loosely coupled processes and mechanisms that a data and services, and safety in case of failures. Digital Image Processing as a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical alg ar an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is als rocessing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray convid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, ac	processes and cor upport high availal Z,ZK orithms that are be so valuable outside compression, de-t ersion, context en dding depth, alpha	4 oth easy to the domain olurring in hancement, matting.
MI-DZO This course prese implement and have of digital image p frequency domain, interactive as-rig MI-EDW.16	n basic algorithms that assure correctness of computations realized by a group of loosely coupled processes and mechanisms that as data and services, and safety in case of failures. Digital Image Processing as a comprehensive overview of modern methods for interactive editing of digital images and video. It mainly deals with practical alg as an interesting theoretical basis. Visually attractive applications provide better understanding of basic theoretical background that is als rocessing. This course will introduce algorithms solving the following practical applications: edge-aware editing, tone mapping, HDR abstraction, hybrid images, gradient domain editing, seamless image stitching and cloning, digital photo-montage, color-to-gray convid-as-possible image deformation, free-form image registration, texture synthesis, interactive segmentation, colorization, painting, actions and the processing interactive as the segmentation, colorization, painting, and the segmentation is a segmentation and the segm	processes and cor upport high availab Z,ZK orithms that are be so valuable outside compression, de-t ersion, context en dding depth, alpha Z,ZK	4 oth easy to the domain olurring in hancement, matting. 5
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In this cause, the subtents get acquired with classification methods used in four inputtient internet, or generally network specifications in specifications in the control in index obtained with the subtent and in a transmission of the structure is a transmission of proteins. The accurace is target in a 2-weeks cycle with a internet index of proteins. The accurace is target in the scales, or in the obtained in the accurate is target. The internet is a structure is target in a 2-weeks cycle with the accurace is target in the accurace is target. The accurace is target in the accurace is target in the accurace is target in the accurace is target. The accurace is target in the accurace in the accurace is target in the accurace is taccurace	understar	d methods for management of internal and external security threats, for IS/IT security audits, and for application security testing (e.g.	, penetration testing	g).
In makes displays hystems and initiation descolar systems. However, they will earn now the norigh how classification any host in the advection of the advectional of	MI-IKM	Internet and Classification Methods	Z,ZK	4
On the background of these explositions, they get an overleved the bundberneliss of userations to house the in activates. The bundber bundle of settings on the bundle of the bundber entropy to the settings. The bundle of the bundber entropy to the settings on the bundle of the bundber entropy to the settings. The bundle of the bundber entropy to the settings on the bundber entropy to the settings on the bundber entropy to the setting on the bundber entropy to the setting on the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the setting of the bundber entropy to the setting of the sett	In this course, the	students get acquainted with classification methods used in four important internet, or generally network applications: in spam filtering	, in recommendation	on systems,
exercises. During the securities to topics from the identity, on the other hand construct that resonance tasks. MH-IOS Advanced techniques in IOS applications IZ 4 Students will learn the latest trends in mobile development technicoges for IOS pittom. Class covers advanced topics, students need to know all the bases from the beginners class III.OT III.EX 4 The subject is board on the ana of hardware and tobutes in the through point development appoint of various devices. Its goal is threfinitescovie with a state data on the velocities of the state data data with the trapping of undevelopment characteristic indigence. The various devices in the state data data with the trapping of undevelopment characteristic indigence. The various devices is the state state data data with the trapping of undevelopment characteristic indigence. The various devices is the state state data data data data wetter of the indigence and various devices is the state state data data data data data data data				
MH-IOS Advanced techniques in IOS applications KZ 4 Suddents will can the latest tends in mobile development techniques for IOS altabine. Class covers advanced topics, students needs to know all the basis from the beginner class of the basis from the basis from the beginner class of the basis from the basis f	-			
Students will learn the laterat tuneds in mobile development technologies for CSB platform. Class comes advanced topics, students need to know all the basics from the beginners class BM-IGT Internet of Things I.2.K 4 the subject is boated on the area of hardware and software technologies of the technologie of the technologies of the development and modifications with available development internets (RAU) Forth,				
Bi-RDS. MH-IOT Internet of Things Z.ZK 4 The subject is focused on the area of hordware technologies for the atropyly proping computer support of various devices. Its politication evidence and modification (GNU POTA). KI 4 MH-IOT. Intelligent embedded systems insignating and the focuse is to teach subject of technology embedded systems insignating and the focuse is to teach subject on teacher subject and technology embedded systems insignating and technologies. The ourse is an advance version or correling in nonvidege of various courses like nature insignating and technologies. KZ 4 MH-ROD.16 Data Compression ZZK 5 Students are introduced to the subject origination. The yourse is the advance subject on teacher subject and technologies. ZZK 5 Students are introduced to the subject origination. The yourse is the advance application technologies and the onthologies and the onthologies. ZZK 5 Students are introduced to the subject origination. The yourse is the subject origination and and and a period. The subject origination and the onthologies in the origination and anymental ciphelics. The yourse and the outpect and			1	-
MH-IOT Internet of Things IZK 4 The subject is located on the area of hardware and subware strendings for the subgrit strendings and the subgrit strending and the subgrit strending and the subgrit strending and the subgrit strending and the subsect is strendis and the subsect is strending and the subsect is str	Students will learn		asics from the begin	nners class
The soluted in brackets for the rear of hardware technologies for the strongly giving computer support of various devices. It is post is fimiliarized on with evaluable devices of the solution of the strongly giving computer support of various devices. It is post is maintance or various of the integrated of strongly and solutions of the strongly giving computer support of various devices. The second the course is to search students humanic devices is an advance variant of the integrate provide basis of motor control, surrent course, specification and devicement cols. In lads, students where technologies are strongly solutions and second present tools. In lads, students where technologies are strongly introduced to a strong specification reading solution. Students and students humanical devices are not strongly advanced specifications and second present tools. In lads, students where technologies are strongly introduced to a strong specification and second presents are not strong device and strong complex strong strong and strong specification and strong specification control, starter strong and strong specification and strong strong data strong st	MUOT		776	4
development elements (Rasplanery PL, Arduito Duz) and with the language to efficient againstant development and concertaints (CNU Forth). KZ 4 Intelligent embedded system source for master's aggination interlinger, representation source for master's aggination interlinger, robot magination and development tools, in lass clustents develop advance version of the language methods and spatial material spatial development tools. In lass clustents develop advance version advance version clustents develop advances aggination interlinger, robot aggination interlinger, robot aggination interlinger, robot aggination and development tools, in lass clustents develop advanced application interlinger, robot aggination and the robot aggination and contracting granups interlinger. The version aggination interlinger in			· · ·	-
MI-VS Intelligent embedded systems KZ 4 Unitaligent embedded systems course for the barbel courde night of the dendrog embedded systems integrating artification intelligence. The course is an advance application course, and monthematication and development tools. In labs, atubents developed padvanced applications combining interveloped and intervelopment. Sectore 10:0. In labs, atubents developed padvanced applications are interded applications. The overview correspondence of the activity of advanced applications and development tools. In labs, atubents developed padvanced applications are interded bardground and get an overview of data compression methods used in image, audia, and valee compression. The verview correspondence of the activity of advanced Cryptology ZZK 5 Students are introduced to the base protopies of that compression methods used in image, audia, and valee compression. The verview correspondence of the activity of the act				valiable
Inteligent embedded system causes for masters agence is toxed an high-level technology embedded system integrating attribution attribution. The course is an advance vesion de he inteligent embedded system integration and evelopment toxis. In last subters develop advances application interfaces, recording advances application interfaces, recording advances application interfaces. The advances advances application interfaces, recording advances advanc	MI-IV/S			4
of the intelligent embedded system fundamentals course for the backet degree. The aim of the course is to teach students humanod tables produe hasis of motion control, users and and anging applications and steepingent tools. In hisp, students develop advanced applications controlling the produe hasis of motion control, users or advanced applications and steepingent tools. In hisp, students develop advanced applications are informed tools. In hisp, students develop advanced applications are informed tools and the stars proceed and and applications are informed tools. In hisp, students develop advanced applications are informed tools and stars are informed and stars and the information and development. The other and the advanced tools are informed and applications are informed tools and applications are informed tools and applications are informed tools and applications and the advanced tools and velocity of advanced applications are informed tools and applications are informed and applications are informed tools and the advanced Cryptology. The advanced Cryptology and quartum comparison. The advanced Cryptology and quartum comparison and applications are advanced applications and there and tool applications are advanced applications are advanced applications and the advanced Cryptology and quartum comparison. The advanced on advanced and subjects dealing with defined or the comparison. The advanced or advanced and subjects dealing with defined or the comparison and the advanced and applications and there and tool applications are advanced as advanced as dealing with defined or the comparison and the advanced as			I	-
combining knowledge of various course like nature inspired algorithms, data mining algorithms, image receptions and veb technologies Velocity S Bilderis are introduced to the basic principles of intiger conding and of statistical cictorius, and control data compression methods being Nearest and the statistical compression methods being Mi-KRV.16 Advanced Cryptology Z.Z.K 5 Students will each the same principles of integro condition and principles of constructing symmetric and asymmetric control the integration of their con spiteness on the creation difference on spiteness on spiteness on spiteness on spiteness on the creation difference on spiteness on spiteness on the creation and productions. Z/K 5 Students get accualined with the fundamentatis of computer spiteness and subjects dealing with deference of the optimization control with a spiteness on spiteness on spiteness on computer s	-			
MI-KOD 16 Data Compression IZ/K 5 Students are introduced to the base principles of data correston. They will known the necessary adue, and video compression. Instances the impact on the overse principles of introger coding and of statistical. (dicinary, and contret data compression. Instances the mathematical principles of compression. Instances and advance compression. IX/K 16	-		-	
Students are introduced to the basic principles of data compression. They will earn the necessary theoreteal background and get at attactions, students learn the fundamentals of logidal compression methods. In addition, students learn the fundamentals of logidal compression methods used in image, audo, and video compression. They will know the mathematical principles of constructing symmetric and asymmetric coheren by will know the mathematical principles of constructing symmetric and asymmetric coheren by will know the mathematical principles of constructing symmetric and asymmetric coheren by will know the mathematical principles of constructing symmetric and asymmetric coheren by will know the mathematical principles of constructing symmetric and asymmetric coheren by will know the mathematical principles of constructing symmetric and symmet		combining knowledge of various courses like nature inspired algorithms, data mining algorithms, image recognition and web tech	nologies	
used in practice. The overview covers principles of integer coding and d statistical, dictions, und context data compression methods, in addition, students learn the fundamentals of lossy data compression methods, see integers, audio, and video compression. Leaving, and video compression methods, and the mathematical principles of constructing symmetric and symmetric aphers. They will have an overview of crystandysis methods, eliptic curve crystography and quartum cryptography, which they can apply to the integration of their was systems or to be creation of their cows systems or to compute survey and quartum cryptography, which they can apply to the integration of their state agencies and ables is no week of systems for computer survey and traditions in the area of globics of the cyberspace. Students will also familiare themselves with hader achilles and behavior. The course will also discuss the cooperation of the state agencies and subjects dealing with defense of the cyberspace (sepecially CSRF and CERT team). MI-LOM.16 Linear Optimization and Methods ZZK 5 Students is the achieve of the state agencies and subjects dealing with defense of the cyberspace (sepecially CSRF and CERT team). The course subjection and allocation of resources (transportational or optimization programming. ZZK 5 MI-LOM.16 Multication and allocation of assources (transportational complexity of cybinization problems in computer scol	MI-KOD.16	Data Compression	Z,ZK	5
Uesy data compression methods used in image, audie, and video compression. UH-KRY 16 Advanced Cryptology Z,K 5 Students will kern the essentials of cryptandyse randbes, alight curve exploragely and quartum cryptography, which they can apply to the integration of their own systems or to the creation of their own software solutions. ZK 5 MI-KYB.16 Cryptandyse methods, alight curve exploragely and quartum cryptography, which they can apply to the integration of their own systems or to the creation of their own software solutions. ZK 5 Students gat caquainted with the fundamentals of legislation and international activities in the area of fighting cybercrime. Students will understand the classification of states and have an overview of systems for computer source, audies the data solutions. ZK 5 Students gat caquainted with the fundamentals of legislation and international activities. They are avaire of practical importance (specially) CSIT systems of the association systems of computer science, science, and industry. They are avaire of practical importance of comparison of their and integer programming. Students gat comparison systems or the avaire of practical importance of comparison or computer science. Students will indicate on fersource (strangsportation problems, resc.), issues from economics, and modelling of conflicts via the game theory. They get an overview of computation and comparison or computer science. Students will indicate the student strangsport on the student strangsport on the strangsport on the strangsport on the strangsport on the strangsport on theorematestrestrangsport and theoremate resc. S	Students are intro	boduced to the basic principles of data compression. They will learn the necessary theoretical background and get an overview of data	compression meth	ods being
MI-KRY 16 Advanced Cryptology Z,ZK 5 Students will beam the essential of cryptanalysis and the antibodis a directivation gammetric adjustment the option. They will have an overview of cryptonysis methods, eliptic curve cryptography and quantum cryptography, which they can apply to the integration of the integration of the creation of their own software solutions. ZK 5 MI-KYB.16 Cryptography and quantum cryptography, which they can apply to the integration of the area of fighting optionalism. Students will note: an other oth	used in practice. T		ents learn the funda	amentals of
Students will learn the essentials of cryptanaysis and the mathematical principles of constructing symmetric and asymmetric processes, apply to the integration of their own systems or to the creation of their own software solutions. MH-YB16 Cybernality ZK 5 Students get acquisited with the fundamentals of legication and international activities in the areas of fighing cyberrines. Students will understand the classification of attacks and have an overview of systems for computer surveillance and traffic monitoring in the cyberspace. Students will also familiarius themselves with hader activities and behavior. The course will also familiarius themselves with hader activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves with hader activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves with adder activities and behavior. The course will also familiarius themselves the systems in computer selence, accomparity, and have an exploration problems. They get an exploration problems. They get an exploration and production of nultimedia data and technologies for processing and metwork transmission of multimodia ginal metworks with adder activities and technologies for visualizations in intervition and improving and metwork with adder activities and technologies for visualizations and metworks and regionation of public states and technologies for processing and metwork with and familiarity states and regionatin a distri				
andom number generators. They will have an overview of cryptanalysis methods, elliptic curve cryptography, which they can apply to the integration of their own systems or to system for computer surveillance and traitin monitoring in the cyberspace. Students will also familiarize themselves with haden achieves and behavior. The course will also discuss the cooperation of the state agencies and subjects dealing with define or the cyberspace by Stills in formatistic motion of systems for computer surveillance and traiting monitoring of that systems. They get stills in formatistic motion problems in computer science, economics, and industry. They are aware of practical importance of linear and integer programming. They are able to work with optimization or potherms, truevilling aslesman problems, they get averveive or computer science (such as scheduling of tasks store get an overvice used in orgamming and allocation of optimization or potherms, truevilling aslesman problems, they get averveive or complexity of optimization problems. They get orientation in algorithms in linear programming. MI-MAI MUMInterQia and Internet Z,ZK 3 The course will cover principality and they definition. Lectures will include again and technologies for visualizations or high definition. Lectures will include again they definition. Lectures will include again they definition. Lectures will include again they ore systems. Z,ZK 3 MI-MAI MUMIntore Systems for covers principality and technologies for visualizations or high definition. Lec		51 05	, i	-
Interview Students get acquainted with the fundamentals of legislation and international activities in the area of lighting cyberorime. Students will understand the classification of attacks and have an overview of systems for computer sourcelliance and traffic monitoring in the cyberspace. Students will and familiar the threaches/tes with hacker activities and behavior. The course will also discuss the cooperation of the state agencies and subjects dealing with defence of the cyberspace. Students will and behavior. The course will also discuss the cooperation of the state agencies and subjects dealing with defence of the cyberspace. Students will ange the cyberspace (septead). CSIRT and CERT Harms. MI-LOO.16 Linnear Optimization and Methods Z,ZK 5 Students learn the applications of optimization mothods in computer solution, economics, and adlocation of resources (transportation problems, traveling assessment) in algorithms in linnear topgramming of that software and a technologies for processing and network thread adlocation of resources (transportation problems, They get satisfication and reproduction and reproduction of adla and technologies for processing and network transmissions of multimedia signals, stereoscopy and visualizations in high definition. Lectures will include collaboration using networking and immersive environments. MI-MBL16 Management of Business Informatics Z,ZK 3 Students understand architecture of system based on multicore bystems based on multicore systems is presented in Czech. X 4 MI-MDL16 Management of Business Processes Z,ZK 5 Students tarm new te				•
MI-KPE:16 Cybernality Zk 5 Students get acquaited with the fundamentals of legislation and international activities in the area of fighting cybercrime. Students will understand the classification of latexts and the area or vervices of advances and the computer surveillance and traffic monitoring in the cyberspace. Students will also familiarize themselves with hacker activities and behavior. The course will also familiarize themselves with hacker activities and behavior. The course will also familiarize themselves with hacker activities and behavior. The course will also familiarize themselves with hacker activities and behavior. The course will also familiarize themselves with hacker activities and behavior. The get also were with applications of obstimutions on computer science, economics, and modelling of tasks to processors, analysis of network flows), distribution and allocation of resources (transportation problems, travelling salesman problems, the get allow the with tophimization or horizen in adjustment in linear programming. MI-MAI MI-MMI Multimedia and Internet Z,ZK 3 The course will cover principles and technologies for processing and network transmissions of multimedia signals, streneocopy and visualization in algorithms and distributed collaboration using networking and immersive environments. Z,ZK 5 MI-MCS MI-MCS X,ZK 5 MI-MCS Multicore Systems KZ 4 Students understand activities in the analysis technologies for cyclualization of analtel algorithm. After this course is presented in C2axh. KZ <td>random number</td> <td></td> <td>an apply to the inte</td> <td>gration of</td>	random number		an apply to the inte	gration of
Students get acquainted with the fundamentals of legislation and international activities in the area of lighting ophercines Students will understand the classification of attacks and have an overview of systems for computer surveillance and traffic monitoring in the opterspace. Students will also familiarize themsheves with backer activities and behaviors. The ocurse will also discuss the cooperation of the state agencies and subjects dealing with defence of the cyberspace (especially CSIRT and CERT teams). IMI-LOM.16 Image: Computer surveillance, ecoromics, and modustry. They are aware of practical importance of linear and integer programming. They are aware ostate in the agencies stock as scheduling of tasks to processors, analysis of network from solution and allocation of resources (transportation problems, trach), issues form economics, and modelling of conflicts via the game theory. They get an overview of computational completely of optimization problems, traching asseman problems, etc.), issues form economics, and modelling of processing and network transmission of multimedia signals, stereascopy and visualizations in high definition. Lectures will indude application areas of networked multimedia, transmission formats, interfaces, codec, technologies for acquisition and reproduction of multimedia data and technologies for visualizations and motivation and and interments. MI-MGI Management of Susiness Informatics Z, Z/K 5 MI-MCS MI-MCS Minite Threads Multiple Data), measure and analyze latency and throughput of parallel algorithms, tracks and multiple breads per core, structure and usage of cache hierarchy with shared task event. They get an analyze latency in the desification, parallel algorithms, and optimization processes (rapid) approximations. MI-MDL MI MULT programs (Multipe Threads Multiple Data), measure and analyze latency and throughput of parallel algorithms and parallel algorithms. All there is usues, advanders and the asselfaced in parallel algorithm and there intheorem suback and techn			71/	-
have an overview of systems for computer surveillance and traffic monitoring in the cyberspace. Students will also familiars descendents with also familiars descendents and CERT teams). MI-LOM.16 Linear Optimization and Methods Z,ZK 5 Students learn the applications of optimization methods in computer science, economics, and motistry. They are aware of practical importance of linear and integer programming. They get an every work of computations problems, travelling salesman problems, etc.), issues from economics, and modelling of conflicts via the game theory. They get an every work of computation completely of optimization problems, they del orientation in algorithms in linear programming. MI-MAI Multimedia and Internet Z,ZK 3 The course will cover principles and technologies for processing and network transmissions of multimedia signals, storescopy and visualizations of being store visualizations and distributed collaboration using networking and immensive environments. Z,ZK 5 MI-MGS Multicore Systems KZ 4 Students understand architecture of systems based on multicore systems: and distribute collaboration and monitoring tools for measurement and optimization or planet systems. KZ 4 Multicore Transcipes and technologies in the area of service-circlented architectures, web services, middleware, and toolaboration using networking and immensive environments. KZ 4 Multicore Systems KZ 4 5				-
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MI-LOM 16 Linear Optimization and Methods Z.ZK 5 Students learn the applications of optimization methods in computer science, economics, and motaty. They are aware of practical importance of linear and integer programming. They are able to work with optimization oroblems, traveling aslesman problems, etc.), issues from economics, and modelling of conflicts via the game theory. They get an overtainton and application accessors, analysis of network flows), distribution and allocation of resources (unaportation problems. They get orientation in algorithms uses from economics, and modelling of conflicts via the game theory. They get an overtaind on allocations of resources due to prove of computational complexity of optimizations in high definition. Letrures will include application areas of networked multimedia, transmission formats, interfaces, codesc, kchmologies for acquisition and proteins. Z.ZK 3 MI-MB.16 Management of Business Informatics Z.ZK 5 MI-MCS Millicore Systems KZ 4 Students understand, architecture of systems based on multicore processors with multiple threads per core, structure and usage of cache hierarchy with shared last back. They learn on the structure systems. KZ 4 MI-MCS Multiple Threads Multiple Data), measure and analyze latency and throughput of parallel algorithms. After this course, students and informatics interfaces processes Z.ZK 5 MI-MCS Multiple Threads Multiple Data), measure and analyze latency and throughput of parallel algorithms. and optimize them tor contem				
Students learn the applications of optimization methods in computer science, economics, and industry. They are aware of pradical importance of linear and integer programming. They are aware of pradical importance of linear and integer programming. They are aware of pradical importance of linear and integer programming. They are aware of pradical importance of pressions and are familiar with languages used in programming. Integer programming. They are aware of pradical importance of pressions and network flows), distribution and allocation of resources (transportation problems, travelling selesman problems, tec.), issues from economics, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. They get orientation in algorithms in line are programming. The course will cover principles and technologies for processing and network transmissions of multimedia signals, strerecoxy and visualizations in high definition. Lectures will include application areas of networked multimedia, transmission formats, interfaces, codecs, technologies for acquisition and reproduction of multimedia data and technologies for visualizations and distributed collaboration using networking and immersive environments. MI-MBI.16 Mangement of Business Informatics Z,ZK 4 4 Students understand architecture of systems based on multicore processors with multiple threads per core, structure and usage of cache hierarchy with shared last level. They learn parallel algorithm classification, parallel programming technics, simulation and monitoring tools for measurement and optimization of parallel algorithms. After this course, students can device the tenes of the course on the course prove nucleoce systems. MI-MDW.16 Web Services and Middleware Z,ZK 5 The subject is focused on introduction to the disciptine of Enterprise Engineering. Students learn the importance of a proper methodological approach for (re)engineering and implementation optices and introduction support in big enter				5
are able to work with optimization software and are familiar with languages used in programming of that software. They get skills in formalization of problems, tex-ly, issues from economics, and modelling of costists is the game theory. They get an overview of computational complexity of optimization problems, tex-ly issues from economics, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems, tex-ly issues from economics, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. They get orientation in algorithms in linear programming. In linear programming, and internet Z,ZK 3 the course will cover principles and technologies for processing and network transmissions of multimedia signals, streeoscopy and visualizations in high definition. Lectures will include application areas of networked multimedia, transmission formats, interfaces, codecs, technologies for acquisition and reproduction of multimedia data and technologies for visualizations and distributed collaboration using networking and immersive environments. The locures is presented in Czech. This course is presented in Czech. Multicore Systems is presented in Czech. Multiple threads per core, structure and usage of cache hierarchy with shared last level. They learn parallal algorithm classification, paralle largorithm, share this surve, simulation and monking to for sage and Middleware Z, ZK 5 Students learn new trends and technologies in the area of service-oriented architectures, web services, middleware and cloud computing, including their theoretical background. MIM-DP Modelling of Business Processes and Middleware and acquise the importance of a proper methodological approach for (re)regineering and implementation of processes, organisation structures and information support in big enterprises and institutions. Multiple threads per core, structures and information systems. Cryptography. They learn the mathematical			· · ·	-
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MI-MAI Multimedia and Internet Z,ZK 3 The course will cover principles and technologies for processing and network transmissions of multimedia signals, stereoscopy and visualizations in high definition. Lactures will include application areas of networked multimedia, transmission formats, interfaces, codes, technologies for acquisition and reproduction of multimedia data and technologies for visualizations and distributed collaboration using networking and immersive environments. X,ZK 5 MI-MBI.16 Management of Business Informatics Tibis course is presented in Czech. Z,ZK 5 MI-MCS Multicore Systems KZ 4 Students understand architecture of systems based on multicore processors with multiple threads per core, structure and usage of cache hierarchy with shared last level. They learn parallel algorithms called largorithms. After this course, students can design MTMD programs (Multiple Data), measure and analyze latency and throughput of parallel algorithms. After this course, students can design IMTMD programs (Multiple Threads Multiple Data), measure and analyze latency and thickeleware Z,ZK 5 Students learn new trends and technologies in the area of service-oriented architectures, wile besivices, middleware, and cloud computing, including their theoretical background. Z,ZK 5 Students learn new trends and technologies in the area of service-oriented architectures, and quantum cryptography. They learn the mathematica principles on which security of encryption systems, cryptanalysis methods, cryptography over elliptic curves, and qu	issues from econd	mics, and modelling of conflicts via the game theory. They get an overview of computational complexity of optimization problems. The	y get orientation in	algorithms
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aim at fine-tuning the FT topic so that the FTT will be complete and approvable at the end of the semester.			-	
		aim at fine-tuning the FT topic so that the FTT will be complete and approvable at the end of the semester.		

MI-MPX	Management practice	Z	4
The Student can o	nce, within its master's degree graduate (to apply) management practices in the selected subject of practice (business subject) on the o	perational, tactical	or strategic
level of manager	nent (typically at the position of project manager, middle or top manager). The selected subject of practice and professional filling is as	ssessed well in adv	vance the
course guarantor	. In the selected subject of practice may not have a substantial ownership interest or substantial decision-making influence of the relat	ives of the student	(e.g. as a
	member of the top management).		
MI-MSI	Mathematical Structures in Computer Science	Z,ZK	4
	Mathematical semantics of programming languages.	<i>,</i> 1	
MI-MTI.16	Modern Internet Technologies	Z,ZK	5
	nnologies of the modern Internet. links of the IP technology to the modern communication networks, mechanisms for multicasting and re	· · ·	-
	ns of virtual channels, and the new IPv6 architecture. They will understand the issues of monitoring and management of large computer		
	to the technologies of interconnection networks for HPC systems.	,	
MI-MVI.16	Computational Intelligence Methods	Z,ZK	5
	erstand methods and techniques of computational intelligence that are mostly nature-inspired, parallel by nature, and applicable to ma		-
	how these methods work and how to apply them to problems related to data mining, control, intelligen games, optimizations, e		
MI-MZI	Mathematics for data science	Z,ZK	4
	lents are introduced to those fields of mathematics that are necessary for understanding standard methods and algorithms used in da	· · ·	
	inear algebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality princi		
,	selected notions from probability theory and statistics.	1 ., 5	,
MI-NFA.16	Design for the FPGA and ASIC Technology	Z,ZK	5
	e basic knowledge needed to start a career in a design house. They will understand the FPGA and ASIC implementation technologies		
	bee on the design. They are able to perform and to manage typical workflows, their analytic and synthetic steps, with an emphasis on l		
iologioo imp	the structure and demands of software tools, as well as what to expect from them.		
MI-NSS.16	Normalized Software Systems	ZK	5
	Infinitized Software Systems In the foundations of Normalized Systems theory, which studies the evolvability of modular structures based on concepts from engine	1	-
	d entropy from thermodynamics. Initially, the theory was developed at the level of software architectures, where the concept of stability was	-	-
	natorial effects. These effects occur when the impact of a change to the software architecture is dependent on the change itself, as well		
	undesirable, as it will cause even a simple change to incur an ever-increasing impact as the size of the system grows over time. As su		-
• •	a main cause of Lehman?s Law of Increasing Complexity (see, e.g., http://en.wikipedia.org/wiki/Lehman's_laws_of_software_evolutior		
	n the study of which micro-states in a modular structure correspond with a given macro-state. This is related mainly to issues such as tes		
Normalized Syste	erns theory consists first of a set of principles which indicate where violations of stability and entropy-related issues occur in any given	software architectu	ure. These
principles indicate	that very fine-grained modular structures are required in order to control them. In the second part of the theoretical framework, it is show	wn how software ar	rchitectures
can be constructed	based on a set of 5 design patterns called elements. These elements provide the core functionality of information systems in terms of s	toring data, executi	ing actions,
workflows, connect	tors and triggers, while controlling for violations of the stability and entropy-related principles, allowing them to realize new levels of evolva	bility in software are	chitectures.
Recently, Normaliz	ed Systems theory was also applied to the modular structures in business processes and enterprise architectures, with the goal of cons	structing a foundati	ional theory
	for Enterprise Engineering.		
MI-NUR.16	User Interface Design	Z,ZK	5
Students will unde	stand the theorical background of human-computer interaction and user interface (UI) design, will learn formal description of UIs, formal	user models, the fu	undamental
notions and p	ocesures. They get acquainted with graphical, speech, and multimodal UIs. Thanks to the gained knowledge, the students will be able	to design advance	ed Uls.
MI-OLI	Linux Drivers	Z,ZK	4
The Linux operatin	g system is an important operating system for personal computer and also for embedded systems. Systems on chip and combining po	werful processors a	and FPGAs
increase the var	iability of peripheral subsystems requiring specific software drivers. This course is an advanced course in the Linux driver developmen	t for master's stude	ents. The
cc	urse provides knowledge of Linux operating system architecture, principles of development of various types drivers, including practica	al experience.	
MI-PAA	Problems and Algorithms	7.71/	
		Z,ZK	5
Students are able	o evaluate discrete problems by complexity and by the purpose of optimisation (on-line tasks, multicriterial optimisation). They unders	,	
	o evaluate discrete problems by complexity and by the purpose of optimisation (on-line tasks, multicriterial optimisation). They unders f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practi	tand principles and	
c	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practi	tand principles and cal problem.	d properties
MI-PAL	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practi- Advanced Algorithms	tand principles and cal problem.	d properties
MI-PAL The students will le	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practice of the Advanced Algorithms Advanced Algorithms are not covered by modules of the Back are the most important advanced algorithms in different domains of the computer science that are not covered by modules of the Back	tand principles and cal problem. Z,ZK helor program Infor	d properties 4 rmatics and
MI-PAL The students will le	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practi- Advanced Algorithms	tand principles and cal problem. Z,ZK helor program Infor	d properties 4 rmatics and
MI-PAL The students will le other modules of	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practi Advanced Algorithms arn the most important advanced algorithms in different domains of the computer science that are not covered by modules of the Back the Master program. They will also learn how to cope with problems that, according to the present knowledge, are not solvable optima time.	tand principles and cal problem. Z,ZK helor program Infor ally in polynomially	d properties 4 rmatics and bounded
MI-PAL The students will le other modules of MI-PAM	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practice of the most important advanced algorithms in different domains of the computer science that are not covered by modules of the Back the Master program. They will also learn how to cope with problems that, according to the present knowledge, are not solvable optime time.	tand principles and cal problem. Z,ZK helor program Infor ally in polynomially Z,ZK	d properties 4 rmatics and bounded 4
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MI-PAL The students will le other modules of MI-PAM There are many exactly in practice	If heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practice of the most important advanced algorithms in different domains of the computer science that are not covered by modules of the Back the Master program. They will also learn how to cope with problems that, according to the present knowledge, are not solvable optime time. Efficient Preprocessing and Parameterized Algorithms optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necessing	tand principles and cal problem. Z,ZK helor program Infor ally in polynomially Z,ZK arry to solve these can find a commo	d properties 4 rmatics and bounded 4 problems on property
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MI-PAL The students will le other modules of MI-PAM There are many exactly in practice (parameter) of the and polynomially i which is not pos plethora of param MI-PAP.16 The students gai MI-PDB.16 Students orient th	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practic Advanced Algorithms are not most important advanced algorithms in different domains of the computer science that are not covered by modules of the Back the Master program. They will also learn how to cope with problems that, according to the present knowledge, are not solvable optime time. Efficient Preprocessing and Parameterized Algorithms optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess . We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponer in the input size (which can be huge). Parameterized algorithms also represent a way to formalize the notion of effective polynomial time sible in the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution tetrized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithms or approximation Parallel Computer Architectures in a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore proc GPUs, and neural processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Advanced Database Systems emselves in problems of evaluation and optimization of SQL queries. The next part of the course deals with new concepts of database	tand principles and cal problem. Z,ZK helor program Infor ally in polynomially Z,ZK ary to solve these o can find a commo ntially in this (small) ne preprocessing o n method. We will p esumably) does not a schemes. Z,ZK essors, SoCs and KZ Z,ZK e machines (so call	4 rmatics and bounded 4 problems on property) parameter of the input, present a t exist. We 5 MPSoCs, 3 5 led NoSQL
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MI-PAL The students will le other modules of MI-PAM There are many exactly in practice (parameter) of the and polynomially i which is not pos plethora of param MI-PAP.16 The students gai MI-PDB.16 Students orient th databases), with t MI-PDD.16 Students learn to p time series, etc., a MI-PDP.16 Due to the develop	f heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practi Advanced Algorithms arn the most important advanced algorithms in different domains of the computer science that are not covered by modules of the Back the Master program. They will also learn how to cope with problems that, according to the present knowledge, are not solvable optima time. Efficient Preprocessing and Parameterized Algorithms optimization problems for which no polynomial time algorithms are known (e.g. NP-complete problems). Despite that it is often necess . We will demonstrate that many problems can be solved much more effectively than by naively trying all possible solutions. Often one inputs from practice-e.g., all solutions are relatively small. Parameterized algorithms exploit that by limiting the time complexity exponer n the classical complexity. Such a polynomial time preprocessing is then a suitable first step, whatever is the subsequent solution teterized algorithm design methods and we will also show how to prove that for some problem (and parameter) such an algorithm (pre will also not miss out the relations to other approaches to hard problems such as moderately exponential algorithms or approximation Parallel Computer Architectures n a good overview of present parallel architectures and processors:parallel (ILP) microarchitectures, multithreaded and multicore proc GPUs, and neural processors. Students also get hands-on experience with programming these systems. Project And Change Management This course is presented in Czech. Advanced Database Systems enealed mew data models (XML, graph databases, column databases) and languages for working with them (XQuery, XPath, CYPH the course deals with performance evaluation of databases machines. Data Preprocessing Data Detapolem of a	tand principles and cal problem. Z,ZK helor program Infor ally in polynomially Z,ZK arry to solve these can find a commo ntially in this (small) ne preprocessing o n method. We will p sumably) does not a schemes. Z,ZK essors, SoCs and KZ Z,ZK e machines (so call ER, Gremlin). The Z,ZK ources, such as ima n image data or fro Z,ZK el and distributed a	4 properties 4 rmatics and bounded 4 problems on property) parameter of the input, present a t exist. We 5 MPSoCs, 3 5 led NoSQL last part of 5 ages, texts, om Internet. 5 applications

and environments for parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of efficient and scalable parallel algorithms and methods of performance evaluation of their implementations.

	algorithms and methods of performance evaluation of their implementations.		
MI-PIS.16	Advanced Information Systems	Z,ZK	5
	notion of business process logic and its formalization, with business process roles, business rules, and data processing, with the notio		
	es and service solution of business logic. They get acquainted with these notions also for the other types of ISs. They learn about agili ce methods for implementation of these ideas in ISs. They understand modern object-oriented methodologies for modelling of busine		•
artineiai intelligen	processed data, and enterprise ISs. They will get the rules and technologies for successful implementation of IS.	55 processes, busin	1633 Tule3,
MI-POA.16	Advanced Computer System Architectures	Z,ZK	5
	learn the current trends in infrastructure architecture of complex business computer systems. After completion of the module, the stu		
	complex system infrastructure that meets availability and scalability requirements given by the business environment.		
MI-PRC	Programming in CUDA	Z,ZK	4
	e students gain a good overview of present parallel architectures in GPUs. Students also get hands-on experience with programming	-	
MI-PSL	Programming in Scala	Z,ZK	4
	luces the modern programming language Scala which exploits object-functional paradigm. Scala comprises advance language featur library. Scala enables to use of applications functional patterns e.g. H-List, Monads, etc. Scala is used by many powerful frameworks and		•
advance standard	Scala enables to use of applications functional patterns e.g. (PEIs), Monads, etc. Scala is used by many powerturnameworks and Scalaz, etc.	Tiblaties e.g. Flay, C	Cassanura,
MI-PVR	Advanced Virtual Reality	KZ	4
	ices advanced parts of the virtual reality. It is a continuation of the already running graphic objects, especially the creation of 3D mode		
	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	gines (mainly Unity3D). The course is freely connected with the subject VHS (virtual game worlds), students will be able to apply the kr	owledge gained in	this subject
	in virtual reality, or directly create a complex game for VR.		
MI-PVS	Advanced embedded systems used on ARM processors and microcontrollers and their usage in wide range of applications. The course includes a series of advance		4
	s storage devices, motor control, system control and industrial communication. The students obtain both theoretical and also practica	-	
	sistinge devices, motor control, system control and industrial communication. The students obtain both theoretical and also practical systems.	with the second s	
MI-PYT	Advanced Python	KZ	4
	burse is to learn various advanced techniques and methods in Python. The course indirectly continues where Programming in Python		
very hands-on and	it has only tutorials, everything is demonstrated on examples. Classification is based on work in class as well as semestral coursework	. The course is lead	by external
	teachers from Red Hat.		_
MI-REV.16	Reverse Engineering	Z,ZK	5
-	cquainted with the essentials of reverse engineering of computer software. They will learn how processes start and what happens befinds will understand how executable files are organized and how they interact with 3rd party libraries. Another part of the course is dedice		
	tten in C++. Students will also understand principles of disassemblers and obfuscation techniques. A part of the course will also be do	-	-
	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.		
MI-ROZ.16	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		
MI-RRI	udents will learn the fundamental concepts and methods of pattern recognition, including probability models, parameter estimation, an Risk Management in Informatics	ZK	3
	ty is very often considered as one of main objectives to secure targets of information processing. However, to focus on this info secure	1 1	
	t viruses, malware etc. very often means misunderstanding and underestimating of real threats which are around us and which are mo		
	he necessity to continue with business after disaster is also slightly ignored. International standards which are focused on informatics		
• ,	s started to anticipate necessity of risk management. There is no commonly accepted methodology used for this task. Threats which a		le to see
	rldwide, invoke pressures to prepare plans for business continuity management even in the case of dramatic political changes, natura		4
MI-RUB	Programming in Ruby This course is presented in Czech.	KZ	4
MI-SCE1	Computer Engineering Seminar Master I	Z	4
	mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	1 1	
are approached ir	ndividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the	subject is work wit	h scientific
articles and other p	professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher	rs. The topics are ne	ew for each
	semester.		4
MI-SCE2	Computer Engineering Seminar Master II mputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	Z	4 Studente
	individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the		
	professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher	-	
	semester.		
MI-SCR	Statistical Analysis of Time Series	Z,ZK	4
	s with the practical use of the basic time series modelling theory in engineering tasks, ranging from economics (stock exchange prices		
	ng of signals and processes) to computer networks (network components load, attacks detection). The students learn to select a conve alyze its properties and use it for forecasting of future or intermediate values. The stress is put on understanding and adoption of the ma	•	
•	as Both the lab classes and the lectures exploit freely available software packages in order to provide easy and straightforward transfe		•
· · · ·	the academic to the real world.		5
MI-SEP	World Economy and Pupingg	7 71/	4
	World Economy and Business	Z,ZK	•
	presented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of	of technical universit	ty to the
	presented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of iness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about dif	of technical universit fferent religions and	ty to the I cultures,
necessary for doin	presented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of iness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about dil g business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for	of technical universit fferent religions and r the right investmer	ty to the I cultures, nt decision.
necessary for doin Seminars help t	presented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of iness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about dil g business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for o improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course	of technical universit fferent religions and r the right investmer BIE-SEP as a prer	ty to the I cultures, nt decision. requisite.
necessary for doin Seminars help t MI-SIB.16	presented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of iness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about dil g business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for	of technical universit fferent religions and r the right investmen BIE-SEP as a prer Z,ZK	ty to the I cultures, nt decision. requisite. 5
necessary for doin Seminars help t MI-SIB.16 The students will	bresented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of iness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about dif g business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for o improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security	of technical universit iferent religions and r the right investmer BIE-SEP as a prer Z,ZK ut detection and det	ty to the I cultures, nt decision. requisite. 5 fense. The
necessary for doin Seminars help t MI-SIB.16 The students will course explains	bresented in Czech. However, there is an English variant in the program Informatics (N1801 / 4793). The course introduces students of iness. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about did g business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for o improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course Network Security gain theoretical and practical knowledge and experience in the area of current security threats in computer networks, specifically abo	of technical universit iferent religions and r the right investmen BIE-SEP as a prer Z,ZK ut detection and det affic. The course foc	ty to the I cultures, nt decision. requisite. 5 fense. The cuses on

MI-SMI.16	Strategic Management of Informatics	Z,ZK	5		
The course focus	es on the strategic management of information systems. Students will learn the process of creation and implementation of an information	tion strategy, IT go	vernance,		
the importance of ICT for business and interrelations between information strategies and lobal business strategies. Furthermore, they gain the knowledge in the areas of economic					
management of IS/IT, management of investments and ROI, assessment of IT investments and management of human resources in IT (the role of CIO, CEO, CFO). The part of the					
MI-SOC.16	course is the role of project management, risk management and quality assessment of informatics. Systems on Chip	Z,ZK	5		
	cnowledge and skills in the design of large-scale digital systems. They will be familiar with architectures of such systems and communi	· · ·			
	iate workflow to design these architectures, their hardware and software. They will also have knowledge of contemporary methods of	-			
	fault-tolerant systems design.	0.1			
MI-SPI.16	Statistics for Informatics	Z,ZK	7		
Summary of probat	ility theory; Multivariate normal distribution; Entropy and its application to coding; Statistical tests: T-tests, goodness of fit tests, independent	lence test; Random	n processes		
	- stacionarity; Markov chains and limiting properties; Queuing theory	· · · · · · · · · · · · · · · · · · ·			
MI-SWE.16	Semantic Web	Z,ZK	5		
	ndards used for processing and sharing knowledge mainly in the area of web. They get used to designing and using knowledge mode cts as publishing, sharing, exchange, and acquisition of knowledge on the web. The presentation is based on the idea of the semanti	• •			
	and technologies (RDF, RDFS, OWL) and formal models.	5 web, including its	stanuarus		
MI-SYB.16	System Security	Z,ZK	5		
	arize themselves with the actual ICT security needs in all ICT disciplines. Students will gain knowledge of typical network attacks and pro	· · ·	-		
with essential con	munication encryption techniques. They will learn how to work with certain aspects of encryption techniques - passwords and certific	cates. After that, stu	udents will		
	of anti-virus, anti-spam and heuristic analyses used in modern anti-virus solutions or Unified Threat Management (UTM) based soluti	-			
principles of secur	ing websites, web applications and databases. Upon completion of the module, students will have a broad overview of IT security and	d will be able to app	ply it to the		
	integration of various software systems and applications.	774			
MI-SYP.16	Parsing and Compilers	Z,ZK	5		
	upon the knowledge of fundamentals of automata theory, formal language and formal translation theories. Students gain knowledge of va of LR parsing and are introduced to special applications of parsers, such as incremental and parallel parsing.	inous variants and a	applications		
MI-SZ1	Knowledge Engineering Seminar Master I	Z	4		
	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				
	I learn how to properly present and read scientific papers. The work in the seminar will prepare you to attend (and profit from) top machin				
	and summer schools, as well as FIT's own Summer Research Program (VyLet).				
MI-TES.16	Systems Theory	Z,ZK	5		
-	d has the ability to develop systems of incredible complexity (e.g., trains, microprocessors, airplanes, nuclear power plants). However				
	ensuring the correct behavior of a given system have become critical. A key technique for mastering this complexity is the usage of m		-		
	ems that are important for the task at hand, and automated tools for analyzing those models. This subject will present theory and alg the modeling and analysis of complex systems.				
MI-TNN	Theory of Neural Networks	Z,ZK	4		
	tudy neural networks from the point of view of the theory of function approximation and from the point of view of probability theory. At	· · ·	ic concepts		
pertaining to artifici	al neural Networks, such as neurons and connections between them, types of neurons from the point of view of signal transmission,	network topology, s	somatic and		
, , , ,, ,, ,, ,,	, network training, and the role of time in neural networks. In connection with network topology, we get acquainted with its transforma		1 07		
	n with somatic and synaptic mappings, with their composition into mappings computed by the Network, Finally in connection with trail				
	ining and to the fact that training is actually a specific optimization task, recalling the most typical objective functions and the most im I network training. We will see the meaninig of all these concepts in the context of common kinds of forward neural networks. Within the				
	ks, we first notice the connection of neural networks to expressing functions of many variables using functions of fewer variables (Ko				
	ds, we will see how the universal approximation capacity of neural networks can be mathematically formalized as the sets of mappings	-			
being dense in im	portant Banach spaces of functions, in particular in the spaces of continuous functions, spaces of functions integrable with respect to	o a finite measure,	spaces of		
	functions with continuous derivatives, and Sobolev spaces. Within the topic probabilistic approach, we first get acquainted with training based on expectation and training based on a				
random sample, and with probabilistic assumptions about training data with which those two kinds of neural networks can be employed. We will see how it is possible to get an estimate					
	al expectancy of network outputs conditioned by its inputs using the expectancy based learning. We recall the strong and the weak la n analogy of the strong law of large numbers for neural networks and with the assumptions for its validity. Finally, we recall the centra	•	•		
	for neural networks, with the assumptions for its validity and with the hypothesis tests based on it. We will see how those tests can be	-	-		
	topology of the network.				
MI-TS1	Theoretical Seminar Master I	Z	4		
	r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic				
are treated individu	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a v	vork with scientific	papers and		
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.		4		
MI-TS2	Theoretical Seminar Master II r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic	Z Z	4 he students		
	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a v	·			
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.				
MI-TS3	Theoretical Seminar Master III	Z	4		
	r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic				
are treated individu	ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a v	vork with scientific	papers and		
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.		A		
MI-TS4	Theoretical Seminar Master IV r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic	Z Z	4 he students		
	r is intended for students which want to come in deeper contact with contemporary theoretical computer science. It is mostly a classic ally and concern themselves with interesting topics from the latest research in the area. Therefore, an integral part of the course is a v				
	other scholarly literature. The capacity is limited by the the potentials of the teachers of the seminar.				
MI-TSP.16	Testing and Reliability	Z,ZK	5		
	vledge about circuit testing and about methods for increasing reliability and security. They will get practical skills to be able to prepare				
intuitive path sensi	tization and to use an ATPG for automatic test generation. They will be able to design easy testable circuits and systems with built-in-	-self-test equipmer	nt. They will		
	be able to analyze and control reliability and availability of the designed circuits.				

	Artificial intelligence	Z,ZK	5				
The subject deals	in depth with modern approaches and algorithms used in contemporary artificial intelligence. Students will be introduced to advance	d problem-solving t	techniques				
based on search	and inference. A comprehensive overview of formal systems for problem modeling, related solving algorithms, and their practical ap	plications will be pr	resented.				
Emphasis will be p	Emphasis will be placed on logical reasoning in artificial intelligence, which provides various guarantees, such as the completeness of the decision process or the precise justification						
of the decision. The	of the decision. The lecture is based on the classical textbook of artificial intelligence [1]. The extra material on satisfiability, constraint programming, automated planning and robotics						
	can be found in specialized textbooks [2], [3], [4], and [6]. Czech textbooks [5] are a suitable study material for the lecture as	well.					
MI-VEM	Scientific thinking	KZ	2				
The objective of t	he course is to get acquainted with scientific methods and discovery of order and laws of the universe, including the aspects of huma	an life. The subject	combines				
scientific methods	; in natural sciences, mathematics, computer science and humanities. Another aim is to introduce rules and requirements of scientific	communication via	a research				
	papers and posters.						
MI-VMM.16	Retrieval from Multimedia	Z,ZK	5				
	s general knowledge regarding interfaces of portals providing multimedia content, the principles of similarity search, the methods of feat		multimedia				
	objects, indexing, and structure of distributed search engines.						
MI-VYC	Computability	Z,ZK	4				
	Classical theory of recursive functions and effective computability, with applications in provability theory.						
MI-W20.16	Web 2.0	Z,ZK	5				
	rn new trends and technologies on the Web including theoretical foundations. Students will gain an overview about Web applications	· · ·	-				
	programmable Web (REST Architectures, Mashups), basic mechanisms for knowledge representation on the Web (microformats, met		-				
technologies about	data, etc.), mechanisms about collective intelligence (collaborative filtering, predictions of users' behaviours), social networks, and	-	open inkeu				
MI 7040		-	40				
MI-ZS10	Master internship abroad for 10 credits		10				
	once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institu						
	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 week		-				
a foreign institutio	on. 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 exc	ceeds the				
	academic year's dead-line.						
MI-ZS20	Master internship abroad for 20 credits	Z	20				
	once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institu						
	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 week		-				
a foreign institutio	n. 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 exe	ceeds the				
	academic year's dead-line.						
MI-ZS30	Master internship abroad for 30 credits	Z	30				
Each student can	once within his / her master's degree have a foreign internship at a foreign university or other foreign scientific and/or research institu	ition. Before the inte	ernship the				
Dean of the FIT, or t	the vice-dean for study affairs assesses the professional content. The student must provide evidence of the professional content and ex	ktent of the internsh	ip. 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 week	s of full-time emplo	wment with				
a foreign institutio			,				
a loreign institutio	on. 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 exe					
a loreign institutio	on. The maximum number of credits a student can earn for one internship is 30 credits. This amount can be divided into two subjects academic year's dead-line.	if the internship exc					
NI-AML		if the internship exercise Z,ZK					
NI-AML	academic year's dead-line.	Z,ZK	ceeds the				
NI-AML The course introduc	academic year's dead-line. Advanced machine learning	Z,ZK	ceeds the 5 ems, image				
NI-AML The course introduc	academic year's dead-line. Advanced machine learning ces students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field of rec control and interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the	Z,ZK	ceeds the 5 ems, image				
NI-AML The course introduc processing, NI-CAP	academic year's dead-line. Advanced machine learning ces students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field of rec control and interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the Cultural and Social Anthropology	Z,ZK commendation systemethods discus ZK	ceeds the 5 ems, image ssed. 2				
NI-AML The course introduc processing, NI-CAP The one-semester	academic year's dead-line. Advanced machine learning ces students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field of rec control and interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the Cultural and Social Anthropology course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversit	Z,ZK commendation syst the methods discus ZK y of the world - exa	ceeds the 5 ems, image ssed. 2 imples from				
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NI-AML The course introduc processing, NI-CAP The one-semester anthropological res NI-CCC Students work on p BLE,) and introd	academic year's dead-line. Advanced machine learning ces students to selected advanced topics of machine learning and artificial intelligence. The topics present techniques in the field of rec control and interconnection of physical laws with the field of machine learning. The aim of the exercise is to familiarize students with the Cultural and Social Anthropology course aims to acquaint students with the basics of social and cultural anthropology as a scientific discipline dealing with the diversit search from our "exotic" cultures (topics: kinship, religion, social exclusion, migration, globalization, , material culture, language, healt shown. The course is presented in Czech. Creative Coding and Computational Art practical tasks, get acquainted with creative and yet proven methods of visualizing various types of data. The course freely follows the luces students to suitable visualization methods for traditional as well as for open data. It combines well-known visualization technique	Z,ZK commendation system the methods discuss ZK y of the world - exa h, history, death, et KZ basic graphics cou es with artistic met	5 ems, image ssed. 2 mples from c) will be 4 rses (MGA, hods using				
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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 knowledge. The course is designed for those				
interested in advanced computer graphics. Students will gain practical knowledge with realistic texturing and raytracing methods. An integral part of the course is the study of scientific				
articles and their subsequent implementation. The course will be followed by a course PG2 supplementing the knowledge of PG1 on other areas and topics of computer graphics.				
NI-VPR	Research Project	Z	5	
Student obtains the credits for published scientific outputs. The details are at https://courses.fit.cvut.cz/NI-VPR/en.				
PI-SCN	Seminars on Digital Design	ZK	4	
This subject deals with problems of realization and implementation of digital circuits - both combinational and sequential. Basic means of description of digital circuits and basic logic				
synthesis and optimization algorithms are described. Basics of EDA (Electronic Design Automation) systems are given, together with combinatorial problems emerging in EDA.				

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2024-07-27, time 09:33.