

Doporu ený pr chod studijním plánem

Název pr chodu: Master branch Web and Software Engineering, spec. Software Engineering, in English, 2016-2020

Fakulta: Fakulta informa ních technologií

Katedra: katedra softwarového inženýrství

Pr chod studijním plánem: Master branch Web and Software Engineering, spec. Software Engineering, in English, 2016-2020

Obor studia, garantovaný katedrou: Software Engineering

Garant oboru studia: doc. Ing. Tomáš Vitvar, Ph.D.

Program studia: Informatics 2010

Typ studia: Navazující magisterské prezen ní

Poznámka k pr chodu: Compulsory subjects of neighboring specializations can be enrolled as optional ones.

Kódování rolí p edm t a skupin p edm t :

P - povinné p edm ty programu, PO - povinné p edm ty oboru, Z - povinné p edm ty, S - povinn volitelné p edm ty, PV - povinn volitelné p edm ty, F - volitelné p edm ty odborné, V - volitelné p edm ty, T - t lovýchovné p edm ty

Kódování zp sob zakon ení predm t (KZ/Z/ZK) a zkratk semestr (Z/L):

KZ - klasifikovaný zápo et, Z - zápo et, ZK - zkouška, L - letní semestr, Z - zimní semestr

íslo semestru: 1

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
MIE-MPI	Mathematics for Informatics Francesco Dolce, Št pán Starosta Št pán Starosta (Gar.)	Z,ZK	7	3P+1R+1C	Z	PP
MIE-PAA	Problems and Algorithms Petr Fišer Petr Fišer Petr Fišer (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
MIE-MDW.16	Web Services and Middleware Milan Doj inovski Tomáš Vitvar Tomáš Vitvar (Gar.)	Z,ZK	5	2P+1C	Z	PO
MIE-ADP.16	Architecture and Design Patterns Petr Špa ek Petr Špa ek Petr Špa ek (Gar.)	Z,ZK	5	2P+1C	Z	PZ
MIE-V.2017	Purely Elective Master Courses, version 2017 MIE-ARI, MIE-KOD.16,..... (pokra ování viz seznam skupin níže)	Min. p edm. 0	Min/Max 0/0			V

íslo semestru: 2

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
MIE-PDP.16	Parallel and Distributed Programming Pavel Tvrdík Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	5	2P+2C	L	PP
MIE-SPI.16	Statistics for Informatics Petr Novák Pavel Hrabák Pavel Hrabák (Gar.)	Z,ZK	7	4P+2C	L	PP
MIE-PIS.16	Advanced Information Systems Petr Špa ek, Petr Kroha Petr Špa ek Petr Kroha (Gar.)	Z,ZK	5	2P+1C	L	PZ
MIE-FME.16	Formal Methods and Specifications Stefan Ratschan, David M. Cerna David M. Cerna Stefan Ratschan (Gar.)	Z,ZK	5	2P+1C	L	PZ
MI-NSS.16	Normalized Software Systems Jan Verelst, Robert Pergl, Marek Suchánek Robert Pergl Jan Verelst (Gar.)	ZK	5	2P	L	PZ
MIE-V.2017	Purely Elective Master Courses, version 2017 MIE-ARI, MIE-KOD.16,..... (pokra ování viz seznam skupin níže)	Min. p edm. 0	Min/Max 0/0			V

íslo semestru: 3

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
MIE-MPR	Master Project Zden k Muziká Zden k Muziká (Gar.)	Z	7		Z,L	PP
MIE-PDB.16	Advanced Database Systems Martin Svoboda Michal Valenta Michal Valenta (Gar.)	Z,ZK	5	2P+1C	Z	PZ
MIE-NUR.16	User Interface Design Josef Pavlí ek Josef Pavlí ek (Gar.)	Z,ZK	5	2P+1C	Z	PZ

MIE-PV-EM.2016	Compulsory Elective Master Economics and Management Courses , in English, Ver. 2016 <i>MIE-IBE,MIE-SEP</i>	Min. p edm. 1 Max. p edm. 2	Min/Max 2/6			VE
MIE-V.2017	Purely Elective Master Courses, version 2017 <i>MIE-ARI,MIE-KOD.16,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 0	Min/Max 0/0			V

íslo semestru: 4

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garantí (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
MIE-DIP	Diploma Project <i>Zden k Muziká (Gar.)</i>	Z	23		L,Z	PP
MIE-PV-HU.2016	Compulsory Elective Master Humanity Courses, Inclusive of Non-garated Courses, Ver. 2016, English <i>MIE-KYB.16,MIE-HMI,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 1 Max. p edm. 2	Min/Max 2/5			VH
MIE-V.2017	Purely Elective Master Courses, version 2017 <i>MIE-ARI,MIE-KOD.16,..... (pokra ování viz seznam skupin níže)</i>	Min. p edm. 0	Min/Max 0/0			V

Seznam skupin p edm t tohoto pr chodu s úplným obsahem len jednotlivých skupin

Kód	Název skupiny p edm t a kódy len této skupiny p edm t (specifikace viz zde nebo níže seznam p edm t)	Zakon ení	Kredity	Rozsah	Semestr	Role
MIE-PV-EM.2016	Compulsory Elective Master Economics and Management Courses , in English, Ver. 2016	Min. p edm. 1 Max. p edm. 2	Min/Max 2/6			VE
MIE-IBE	Information Security	MIE-SEP	World Economy and Business			
MIE-PV-HU.2016	Compulsory Elective Master Humanity Courses, Inclusive of Non-garated Courses, Ver. 2016, English	Min. p edm. 1 Max. p edm. 2	Min/Max 2/5			VH
MIE-KYB.16	Cybernality	MIE-HMI	History of Mathematics and Infor ...	MIE-STR	Strategy in the ICT industry on ...	
MIE-V.2017	Purely Elective Master Courses, version 2017	Min. p edm. 0	Min/Max 0/0			V
MIE-ARI	Computer Arithmetic	MIE-KOD.16	Data Compression	MI-GLR	Games and reinforcement learning	
NI-GLR	Games and reinforcement learning	MIE-MZI	Mathematics for data science	MIE-ROZ.16	Pattern Recognition	
NIE-VPR	Research Project	MI-SCE1	Seminá po íta ového inženýrství ...	NIE-HSC	Side-Channel Analysis in Hardwar ...	
MIE-BPS	Wireless Computer Networks					

Seznam p edm t tohoto pr chodu:

Kód	Název p edm tu	Zakon ení	Kredity
MI-GLR	Games and reinforcement learning	Z,ZK	4
Oblast posilovaného u ení je aktuáln ve st edu zájmu mnoha výzkumník díky pokrok m v hlubokém u ení, rekurentních neuronových sítí a obecné um lé inteligenci. Tento p edm t jsme p ípravili s cílem seznámit studenty s pot ebnými teoretickými a praktickými základy, aby se mohli v novat výzkumu v této oblasti. Výuka probíhá v angli tin .			
MI-NSS.16	Normalized Software Systems	ZK	5
Students will learn the foundations of Normalized Systems theory, which studies the evolvability of modular structures based on concepts from engineering such as stability from systems theory and entropy from thermodynamics. Initially, the theory was developed at the level of software architectures, where the concept of stability was translated into the definition of so-called combinatorial effects. These effects occur when the impact of a change to the software architecture is dependent on the change itself, as well as on the size of the system. The latter is highly undesirable, as it will cause even a simple change to incur an ever-increasing impact as the size of the system grows over time. As such, combinatorial effects can be considered as a main cause of Lehman's Law of Increasing Complexity (see, e.g., http://en.wikipedia.org/wiki/Lehman's_laws_of_software_evolution). Additionally, the concept of entropy was used in the study of which micro-states in a modular structure correspond with a given macro-state. This is related mainly to issues such as testing in software architectures.			

Normalized Systems theory consists first of a set of principles which indicate where violations of stability and entropy-related issues occur in any given software architecture. These principles indicate that very fine-grained modular structures are required in order to control them. In the second part of the theoretical framework, it is shown how software architectures can be constructed based on a set of 5 design patterns called elements. These elements provide the core functionality of information systems in terms of storing data, executing actions, workflows, connectors and triggers, while controlling for violations of the stability and entropy-related principles, allowing them to realize new levels of evolvability in software architectures. Recently, Normalized Systems theory was also applied to the modular structures in business processes and enterprise architectures, with the goal of constructing a foundational theory for Enterprise Engineering.

MI-SCE1	Seminář po ita ového inženýrství I	Z	4
Seminář po ita ového inženýrství je výb rový p edm t pro studenty, kte í se cht jí zabývat hloub jí tématy íslicového návrhu, spolehlivosti a odolnosti proti poruchám a útok m. Ke student m se v rámci p edm tu p istupuje individuáln a každý student í skupinka student eší n jaké zajímavé aktuální téma s vybraným školitelem. Sou ástí p edm tu je práce s v deckými lánky a jinou odbornou literaturou a/nebo práce v laborato ích K N. Kapacita p edm tu je omezena možnostmi u ítel seminář e. Probíraná témata jsou pro každý semestr nová.			
MIE-ADP.16	Architecture and Design Patterns	Z,ZK	5
The objective of this course is to provide students with both work knowledge about the underlying foundations of object-oriented design and analysis as well as with understanding of the challenges, issues, and tradeoffs of advanced software design. In the first part of the course, the students will refresh and deepen their knowledge of object-oriented programming and get familiar with the commonly used object-oriented design patterns that represent the best practices for solving common software design problems. In the second part the students will be introduced to the principles of software architecture design and analysis. This includes the classical architectural styles, component based systems, and some advanced software architectures used in large-scale distributed systems.			
MIE-ARI	Computer Arithmetic	Z,ZK	4
Students will learn various data representations used in digital devices and will be able to design units realizing arithmetic operations.			
MIE-BPS	Wireless Computer Networks	Z,ZK	4
Students will learn about the modern technologies, protocols, and standards for wireless networks. They will understand the routing mechanisms in ad-hoc networks, multicast and broadcast mechanisms, and data flow control mechanisms. They will also learn about principles of communication in sensor networks. They get knowledge of security mechanisms for wireless networks and get skills of configuration of wireless network elements and simulation of wireless networks using suitable tools.			
MIE-DIP	Diploma Project	Z	23
MIE-FME.16	Formal Methods and Specifications	Z,ZK	5
After the course, students will be able to describe semantics of software formally and to use sound reasoning for construction of correct software. They learn to use some software tools that allow to prove basic properties of software.			
MIE-HMI	History of Mathematics and Informatics	Z,ZK	3
The course focuses on selected topics from calculus, general algebra, number theory, numerical mathematics and logic - useful for today computer science The topics are selected for finding some relations between computer science and mathematical methods. Some examples of applications of mathematics to computer sciences will be showed.			
MIE-IBE	Information Security	ZK	2
Students learn information and IS/ICT security management systems (ISMS), methods for information access control, and basic norms and international standards in this area. They understand methods for management of internal and external security threats, for IS/IT security audits, and for application security testing (e.g., penetration testing).			
MIE-KOD.16	Data Compression	Z,ZK	5
Students are introduced to the basic principles of data compression. They will learn the necessary theoretical background and get an overview of data compression methods being used in practice. The overview covers principles of integer coding and of statistical, dictionary, and context data compression methods. In addition, students learn the fundamentals of lossy data compression methods used in image, audio, and video compression.			
MIE-KYB.16	Cybernality	ZK	5
Students get acquainted with the fundamentals of legislation and international activities in the area of fighting cybercrime. 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 familiarize themselves with hacker activities and behavior. The course will also discuss the cooperation of the state agencies and subjects dealing with defence of the cyberspace (especially CSIRT and CERT teams).			
MIE-MDW.16	Web Services 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.			
MIE-MPI	Mathematics for Informatics	Z,ZK	7
The course comprises topics from general algebra with focus on finite structures used in computer science. It includes topics from multi-variate analysis, smooth optimization and multi-variate integration. The third large topic is computer arithmetics and number representation in a computer along with error manipulation. The last topic includes selected numerical algorithm and their stability analysis. The topics are completed with demonstration of applications in computer science. The course focuses on clear presentation and argumentation.			
MIE-MPR	Master Project	Z	7
1. At the beginning of the semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide on partial tasks that should be carried out during the semester. If the requirements they agreed upon are met, the supervisor awards the student an assessment for the course MI-MPR at the end of the semester. 2. External Master these (MT) supervisor fills his/her assessment into the paper "Form to award assessment by an external Final theses (FT) supervisor" (for the courses BIE-BAP, MIE-MPR, MIE-DIP). Students, then, ensure that the assessment is registered into the information system (IS) by asking their internal FT opponent to award the assessment to the IS based on the confirmation of the external MT supervisor. In the case the FT opponent is external as well, the assessment will be registered to the IS by the head of the department responsible for the topic of the MT. 3. If the FT topic that the student has reserved is rather general, the immediate tasks the supervisor assigns to the student for the upcoming semester should aim at fine-tuning the FT topic so that the FTT will be complete and approvable at the end of the semester.			
MIE-MZI	Mathematics for data science	Z,ZK	4
In this course, the students are introduced to the domains of mathematics necessary for understanding the standard methods and algorithms used in data science. The studied topics include mainly: linear algebra (matrix factorisations, eigenvalues, diagonalization), continuous optimisation (optimisation with constraints, duality principle, gradient methods) and selected notions from probability theory and statistics.			
MIE-NUR.16	User Interface Design	Z,ZK	5
Students will understand the theoretical background of human-computer interaction and user interface (UI) design, will learn formal description of UIs, formal user models, the fundamental notions and procedures. They get acquainted with graphical, speech, and multimodal UIs. Thanks to the gained knowledge, the students will be able to design advanced UIs.			
MIE-PAA	Problems and Algorithms	Z,ZK	5
Students are able to evaluate discrete problems by complexity and by the purpose of optimisation (on-line tasks, multicriterial optimisation). They understand principles and properties of heuristics and exact algorithms and, therefore, are able to select, apply, and experimentally evaluate a suitable heuristics for a practical problem.			
MIE-PDB.16	Advanced Database Systems	Z,ZK	5
Students will get an overview of SQL application debugging and tuning. They will know the methods for evaluation and optimisation which are common to all DB engines. Students will also have the knowledge necessary to design distributed DB systems. They will understand the area of conceptual design of data warehouses.			
MIE-PDP.16	Parallel and Distributed Programming	Z,ZK	5
Due to the development of cloud, web, and communication technologies and due to the shift of the Moore law into multicore and manycore CPUs, parallel and distributed applications are becoming ubiquitous. Students get acquainted with architectures of parallel and distributed computing systems, their models, theory of interconnection networks, and languages			

and environments for parallel programming of shared and distributed memory computers. On selected problems, they will learn the techniques of design of efficient and scalable parallel algorithms and methods of performance evaluation of their implementations.			
MIE-PIS.16	Advanced Information Systems	Z,ZK	5
Students learn the notion of business process logic and its formalization, with business process roles, business rules, and data processing, with the notion of service oriented company, enterprise services and service solution of business logic. They get acquainted with these notions also for the other types of ISs. They learn about agility and adaptivity and using of artificial intelligence methods for implementation of these ideas in ISs. They understand modern object-oriented methodologies for modelling of business processes, business rules, processed data, and enterprise ISs. They will get the rules and technologies for successful implementation of IS.			
MIE-ROZ.16	Pattern Recognition	Z,ZK	5
The aim of the module is to give a systematic account of the major topics in pattern recognition with emphasis on problems and applications of the statistical approach to pattern recognition. Students will learn the fundamental concepts and methods of pattern recognition, including probability models, parameter estimation, and their numerical aspects.			
MIE-SEP	World Economy and Business	Z,ZK	4
The course introduces students of technical university to the international business. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite.			
MIE-SPI.16	Statistics for Informatics	Z,ZK	7
The students will learn the basics of the probability theory, elements of information theory and stochastic processes, and some methods of computational statistics. They will understand the methods for statistical processing of large volumes of data. They will get skills in using computational methods and statistical software for these tasks.			
MIE-STR	Strategy in the ICT industry on case studies	ZK	2
Abstract: The goal of this course is to give students an overview of the most important success factors in a dynamic market of ICT and allow them to think about their own career in the context of real life case studies of contemporary ICT industry. Students will learn the principles of strategic management of companies operating in converging sectors influenced by ICT on real-life case studies discussed directly with entrepreneurs and senior executives of these firms. Two categories of companies will be invited for interactive discussion of their strategy and vision: start-up companies represented by their founders, and the ICT industry's biggest companies such as Google, Microsoft, IBM, Cisco, represented by their senior managers. On the basis of these experiences, students will be able to make their own conclusions on how to succeed in their professional life.			
NI-GLR	Games and reinforcement learning	Z,ZK	4
The field of reinforcement learning is very hot recently, because of advances in deep learning, recurrent neural networks and general artificial intelligence. This course is intended to give you both theoretical and practical background so you can participate in related research activities. Presented in English.			
NIE-HSC	Side-Channel Analysis in Hardware	Z,ZK	4
This course is dedicated to so-called side-channel information leakage in hardware devices. It focuses on both theoretical analysis and practical attacks. Students get familiar with various kinds of side channels and they get deeper insight in power attacks. Students learn to implement various profiled and non-profiled attacks and get familiar with higher-order attacks. They also get practice in both designing the SCA countermeasures and analyzing the amount and characteristics of the side-channel information leakage.			
NIE-VPR	Research Project	Z	5
1. At the beginning of the semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide on partial tasks that should be carried out during the semester. If the requirements they agreed upon are met, the supervisor awards the student an assessment for the course MI-MPR at the end of the semester. 2. External Master these (MT) supervisor fills his/her assessment into the paper "Form to award assessment by an external Final theses (FT) supervisor" (for the courses BIE-BAP, MIE-MPR, MIE-DIP). Students, then, ensure that the assessment is registered into the information system (IS) by asking their internal FT opponent to award the assessment to the IS based on the confirmation of the external MT supervisor. In the case the FT opponent is external as well, the assessment will be registered to the IS by the head of the department responsible for the topic of the MT. 3. If the FT topic that the student has reserved is rather general, the immediate tasks the supervisor assigns to the student for the upcoming semester should aim at fine-tuning the FT topic so that the FTT will be complete and approvable at the end of the semester.			

Aktualizace výše uvedených informací naleznete na adrese <http://bilakniha.cvut.cz/cs/FF.html>

Generováno: dne 15. 05. 2021 v 19:31 hod.