Recomended pass through the study plan

Name of the pass: Master Specialization Digital Business Engineering, 2023

Faculty/Institute/Others:

Department:

Pass through the study plan: Master Specialization Digital Business Engineering, 2023

Branch of study guranteed by the department: Welcome page

Guarantor of the study branch:

Program of study: Informatics

Type of study: Follow-up master full-time

Note on the pass: The remaining credits to the obligation to get a minimum of 120 credits can be obtained for any course of this study plan

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
NIE-KOP	Combinatorial Optimization Petr Fišer, Jan Schmidt Petr Fišer Petr Fišer (Gar.)	Z,ZK	6	3P+1C	Z	PP
NIE-MPI	Mathematics for Informatics Francesco Dolce Št pán Starosta Št pán Starosta (Gar.)	Z,ZK	7	3P+2C	Z	PP
DA-DMI	Data Mining Michal Valenta	Z,ZK	6	30KP+30KC	Z,L	PS
		Min. cours.				
NIE-DBE-PV1.23	Compulsory Elective Courses for Master Specialization DBE - Modern Technology NIE-PDB,DD-ZUM, (see the list of groups below)	1	Min/Max			51
		Max. cours.	5/25			PV
		5				

Number of semes	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
NIE-PDP	Parallel and Distributed Programming Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	6	2P+2C	L	PP
NIE-VSM	Selected statistical Methods Petr Novák Pavel Hrabák Pavel Hrabák (Gar.)	Z,ZK	7	4P+2C	L	PP
DA-DRS	Digital Risk And Security (DA-DRS) Michal Valenta	Z,ZK	6	30KP+30KC	Z	PS
		Min. cours.				
NIE-DBE-PVA.23	Compulsory Elective Courses for Master DBE Specialization A - Normalized Systems Theory NIE-NSS,DA-SEA	1	Min/Max			
		Max. cours.	5/9			PV
		1				

Number of semes	ster: 3					
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
DD-DIN	Digital innovation Michal Valenta	ZK	6		Z	PS
DD-DSG	Digital strategy and governance Michal Valenta	ZK	6	2P+2C	Z	PS

DD-SMN	Strategic management Michal Valenta	ZK	6	4P+0C	Z	PS
NIE-MPR	Master Project Zden k Muziká Zden k Muziká (Gar.)	Z	7		Z,L	PV
		Min. cours.				
	Compulsory Elective Courses for Master Double degree Specialization DBE B - Engineering and Ethics DD-DSE.DA-ESB	1	Min/Max			D) (
NIE-DBE-PVB.23		Max. cours.	3/6			PV
		2				

Number of semester: 4							
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	
NIE-DIP	Diploma Thesis Zden k Muziká Zden k Muziká Zden k Muziká (Gar.)	Z	30	270ZP	L,Z	PP	

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

Kód		Name of the group of group (for specification	f courses and on see here o	codes of members of this r below the list of courses)	Com	pletion	Credits	s Scope	Semester	Role
NIE-DBE-PV1.23		I.23 Compulsory Elective Courses for Master Specialization DBE - Modern Technology		Min. Max	cours. 1 . cours. 5	Min/Ma 5/25	x		PV	
NIE-PDB	Advanced	Database Systems	DD-ZUM	Artificial Intelligence Fundamen		NIE-BLO	E	Blockchain	1	
NIE-AM1	Middleware	e Architectures 1	NIE-SWE	Semantic Web and Knowledge Gra	ph		I			
NIE-DBE-F	NIE-DBE-PVA.23 Compulsory Elective Courses for Master DBE Specialization A - Normalized Systems Theory		Min. Max	cours. 1 cours. 1	Min/Ma 5/9	x		PV		
NIE-NSS	Normalized	d Software Systems	DA-SEA	Software Engineering And Archite						
NIE-DBE-F	PVB.23	Compulsory Electiv Specialization	ve Courses fo DBE B - Engi	r Master Double degree neering and Ethics	Min. Max	cours. 1 cours. 2	Min/Ma 3/6	x		PV
DD-DSE	Data scien	ce and ethics	DA-ESB	Ethical And Sustainable Business						

List of courses of this pass:

Code	Name of the course	Completion	Credits				
DA-DMI	Data Mining	Z,ZK	6				
In the past decade,	In the past decade, weve witnessed a huge increase in the amount of data being captured and stored. In these large datasets very useful knowledge is present, though often concealed						
in the vastness of the data. With data mining techniques patterns are automatically revealed from such large datasets. First, data mining techniques and applications are discussed.							
Next, we will go in	to popular predictive and descriptive data mining techniques, with applications in marketing and risk management. Also, analyses su	ch as social netwo	rk analysis,				
text mining, proce	ess mining, and Big Data will be looked at. Basic programming skills in Python will be learnt. The learned concepts, techniques and p	rogramming langua	age will be				
	applied and evaluated with a real-life case. Teaching takes place at University of Antwerpen. See the web page						
	https://www.uantwerpen.be/en/study/programmes/all-programmes/digital-business-engineering/about-the-programme/study-	ramme/					
DA-DRS	Digital Risk And Security (DA-DRS)	Z,ZK	6				
Information techno	ogy has become crucial in the growth, sustainability and support of enterprises. However, the pervasive use of technologies also incu	rs many business r	isks, anging				
from abuse, cyber	crime, fraud, errors and ommissions. The objective of this course is to understand and analyse IT related business risks and and how	these risks can be	e translated				
into an appropiate i	into an appropiate information risk management and security strategy and action plan. In the course, will first discuss the basics of IT Risk, Information Security, and some of the general						
and specific standards and frameworks to address them. Next, we will elaborate on the IT risk management and IT security functions in an organisation. Specific attention will be given							
to risk assessme	nt methods, both qualitative and quantitative. The theoretical knowledge will be applied in a group project, where students will conduc	ct a risk assessmer	nt in a real				
	organisation, and present the results to the responsible managers. Guarantor and teacher: MSc. Steven De Haes, Ph.D.						

DA-ESB	Ethical And Sustainable Business	ZK	3
This course covers	corporate responsibility, morality and sustainability. It has three main parts: Part 1: Ethics and morality in business History of ethics in	business Origins,	stakeholder
theory, basic philo	sophy Utilitarianism vs Kantian approaches Behavioural economic. Part 2: Corporate responsibility and sustainability in theory Share	d value creation, s	ocial profit,
social entrepreneu	rship Sustainable HR Circular Economy Green Deal and CSRD New business models for sustainability. Part 3: Corporate responsibility in the value of a company products appreach to sustainability in the value of a company products appreach to sustainable the sustainability.	ty and sustainability	y in practice
at Univer	rsity Antwerpen. See the web page https://www.uantwerpen.be/en/study/programmes/all-programmes/digital-business-engineering/a	bout-the-programm	iakes place ie
DA-SEA	Software Engineering And Architecture	Z,ZK	9
Basic software eng	ineering structures, practices, and patterns are explained in a realistic software engineering environment using the Java progarmming la	inguage. Practical a	assignments
complement these	e lectures. Basic software architecture structures, practices, and patterns are explained and discussed, including various aspects of e	volvability. Video le	ectures and
	a practical assignment deepen this. leaching takes place at University of Antwerpen. See the web page	rammo/	
		7k	6
This course focuse	es on innovation in the context of the digital, software-intensive economy. Starting from a broader perspective on innovation, both mai	instream theories a	and thinking
on innovation, as v	well as alternative views from challengers, are discussed. This includes omnipresent innovation models in which IT-related innovation	s are adopted by s	tartups and
scaleups (eg. bloc	kchains or drones) and making them available in certain business domains, which requires agility and speed of development at the s	oftware level. Also	, disruptive
innovation, where	existing value chains are challenged, is discussed with its requirement for new levels of productivity in software development. Leading	g theories are disc	cussed and
illustrated with loc	al and international cases using guest lectures. Students of a master double degree specialisation Digital Business Engineering will a categories of the partner university. Antworp	attend this course of	during their
	Deta apipago and othiog	71/	2
Ethics tell us ab	Data Science and entrics and wrong. The course will provide an overview of key: (1) concepts, related to privacy, discrimination, transparency, and exit	∠n plainability (2) tech	niques to
assess and improv	ve on these aspects, and (3) cautionary tales that motivate the importance thereof. The consideration of data science ethics is crucial	for any data-drive	n company,
as will be motivate	ed by ample cautionary tales. With a wide range of cases, the large implications of new data science technologies on ethics will be dis	scussed. These inc	lude online
tracking, medica	I records, Facebook data, Internet censorship, big data, privacy engineering, and Artificial Intelligence. Data scientists and business	managers are not i	nherently
unethical, but at	the same time not trained to think this through neither. This course aims to address this important gap. Students of a master double of	degree specialisati	on Digital
	Business Engineering will attend this course during their stay at the partner university Antwerp		-
DD-DSG	Digital strategy and governance	ZK	6 6
three main theme	ies a complete and comprehensive overview of what digital governance entails and now it can be applied in practice. The course is o s: concents and practices of digital governance, the impact of digital governance on business/IT strategic and operational alignment	and the notion of c	ligital value
and risk. The cours	se is based on the teacher's knowledge obtained in applied research projects on the relationship between digital governance practice	s and digital value	. To support
the student in un	derstanding and absorbing the material provided, the course uses short assignments and case studies. Students of a master double	degree specialisat	ion Digital
	Business Engineering will attend this course during their stay at the partner university Antwerp		
DD-SMN	Strategic management	ZK	6
In the first part of	the course, the different concepts and perspectives of strategic management are analyzed. The basic characteristics of strategic thinl	king are being anal	lyzed. Then
The importance of r	nission/vision, as the starting point in strategic thinking, is being discussed. I his is being linked to the broader concept of sustainability / is focus on the three basic dimensions of strategy: (1) the strategy content: business level strategy, comporte level strategy, and network	corporate social re	the strategy
process: strategic	formation, strategic change, and strategic innovation. (3) the strategy context: the industry context, the organizational context, and the	e international cont	ext. In each
of the different ch	apters, the fundamental strategic management paradoxes are situated and evaluated in the strategic management theory. Attention is	s also given to som	ne strategic
management tools	which can be used to manage the strategy process. Students of a master double degree specialisation Digital Business Engineering	y will attend this co	urse during
	their stay at the partner university Antwerp		
DD-ZUM	Artificial Intelligence Fundamentals	Z,ZK	5
Students are introc	luced to the fundamental problems in the Artificial Intelligence, and the basic methods for their solving. It focuses mainly on the classic	al tasks from the ar	reas of state
be presented as	aragent systems, game theory, planning, and machine learning, wodern son-computing methods, including the evolutionary algorithm swell. This course is only for students of the double degree program with the University of Antwerp. Other students are not allowed to	s and the neural ne	enrol the
	BIE-ZUM course instead.		
NIE-AM1	Middleware Architectures 1	Z.ZK	5
Students will stud	dy new trends, concepts, and technologies in the area of service-oriented architectures. The will gain an overview of information systemetry of the area of service-oriented architectures.	em architecture, we	eb service
architecture and ap	lication servers. The will also study principles and technologies for middleware focused on application integrations, asynchronous comm	nunications and hig	h availability
	of applications. This course replaces the course MIE-MDW.		
NIE-BLO	Blockchain	Z,ZK	5
Students will under	stand the foundations of blockchain technology, smart contract programming, and gain an overview of most notable blockchain platfor	ms. They will be abl	le to design,
relationship betwe	the blockchains and information security. It is concluded with a defense of a research or applied semester project, which prepares the	e students for imple	ementing or
	supervising implementation of blockchain-based solutions in both academia and business.		5
NIE-DIP	Diploma Thesis	Z	30
NIE-KOP	Combinatorial Optimization	Z,ZK	6
The students will	gain knowledge and understanding necessary deployment of combinatorial heuristics at a professional level. They will be able not on	y to select and imp	blement but
	also to apply and evaluate heuristics for practical problems.		1
NIE-MPI	Mathematics for Informatics	Z,ZK	7
The course focuses	s on selected topics from general algebra with emphasis on finite structures used in computer science. It includes topics from multi-variate	analysis, smooth c	optimization,
numerical algorith	megration. The third large topic is computer antiminetics and number representation in a computer along with enormalipulation. The	ses on clear preser	ntation and
	argumentation.		
NIE-MPR	Master Project	Z	7
1. At the beginning	g of the semester, a student reserves her/his final thesis topic and gets together with its supervisor. Together they decide on partial ta	sks that should be	carried out
during the semeste	er. If the requirements they agreed upon are met, the supervisor awards the student an assessment for the course MI-MPR at the end of	of the semester. 2.7	The external
supervisor enters t	he information on granting the credit using the form "Granting credit from the external supervisor of the final thesis" (http://fit.cvut.cz/s	student/studijni/form	nulare). The
is rather general	the immediate tasks the supervisor assigns to the student for the uncoming semester should aim at fine-tuning the ET topic so that if	the FTT will be con	as reserved
is rather general,	approvable at the end of the semester.	INCT TT WINDE CON	יטיסים מווע
NIE-NSS	Normalized Software Systems	ZK	5
Students will learn	the foundations of normalized systems theory that studies the evolvability of modular structures based on concepts from engineering	, such as stability f	rom system
theory and entropy	from thermodynamics. Students will understand a set of principles that indicate where violations of stability and entropy-related issu	es occur in any giv	en software
architecture. In the	second part of the course, students learn how to construct software architectures using a set of 5 design patterns called elements. The	ese elements prov	ide the core

functionality of information systems in terms of storing data, executing actions, workflows, connectors, and triggers, while handling violations of the stability and entropy-related principles. This knowledge allows students to realize new levels of evolvability in software architectures.

	This knowledge allows students to realize new levels of evolvability in software architectures.					
NIE-PDB	Advanced Database Systems	Z,ZK	5			
Students orient themselves in problems of evaluation and optimization of SQL queries. The next part of the course deals with new concepts of database machines (so called NoSQL						
databases), with th	databases), with the related new data models (XML, graph databases, column databases) and languages for working with them (XQuery, XPath, CYPHER, Gremlin). The last part of					
	the course deals with performance evaluation of database machines. This course is equivalent to the course MIE-PDB.					
NIE-PDP Parallel and Distributed Programming Z,ZK						
21st century in co	mputer architectures is primarily influenced by the shift of the Moore's law into parallelization of CPUs at the level of computing cores	. Parallel computir	ng systems			
are becoming a u	biquitous commodity and parallel programming becomes the basic paradigm of development of efficient applications for these platfor	ms. Students get a	acquainted			
with architectur	es of parallel and distributed computing systems, their models, theory of interconnection networks and collective communication oper	ations, and langua	ages and			
environments for	parallel programming of shared and distributed memory computers. They get acquianted with fundamental parallel algorithms and on	selected problem	s, they will			
learn the technique	es of design of efficient and scalable parallel algorithms and methods of performance evaluation of their implementations. The course	includes a semest	er project of			
	practical programming in OpenMP and MPI for solving a particular nontrivial problem.					
NIE-SWE	Semantic Web and Knowledge Graphs	Z,ZK	5			
The students will	earn the most recent concepts and technologies of the Semantic Web. The course will provide an overview of the Semantic Web tec	nnologies, method	is and best			
practices for mod	lelling, integration, publishing, querying and consumption of semantic data. The students will also gain skills in creation of knowledge	graphs and their s	systematic			
	quality assurance.					
NIE-VSM	Selected statistical Methods	Z,ZK	7			
Summary of probal	Summary of probability theory; Multivariate normal distribution; Entropy and its application to coding; Statistical tests: T-tests, goodness of fit tests, independence test; Random processes					
	- stacionarity; Markov chains and limiting properties; Queuing theory					

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-07-21, time 12:19.