Study plan

Name of study plan: Open Informatics - Computer Engineering

Faculty/Institute/Others: Faculty of Electrical Engineering

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch: Program of study: Open Informatics Type of study: Follow-up master full-time

Required credits: 85

Elective courses credits: 35 Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 49

The role of the block: P

Code of the group: 2018_MOIDIP Name of the group: Diploma Thesis

Requirement credits in the group: In this group you have to gain 25 credits Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 25 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BDIP25	Diploma Thesis	Z	25	22s	L	Р

Characteristics of the courses of this group of Study Plan: Code=2018_MOIDIP Name=Diploma Thesis

BDIP25	Diploma Thesis	Z	25			
Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will						
he enecified by branch	on specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination					

Code of the group: 2018_MOIP

Name of the group: Compulsory subjects of the programm

Requirement credits in the group: In this group you have to gain 24 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 24 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B4M35KO	Combinatorial Optimization Zden k Hanzálek Zden k Hanzálek (Gar.)	Z,ZK	6	3P+2C	L	Р
B4M33PAL	Advanced algorithms Marko Genyk-Berezovskyj, Daniel Pr ša, Ond ej Drbohlav Daniel Pr ša Daniel Pr ša (Gar.)	Z,ZK	6	2P+2C	Z	Р
B4MSVP	Software or Research Project Ivan Jelínek, Jaroslav Sloup, Ji í Šebek, Martin Šipoš, Drahomíra Hejtmanová, Jana Zichová, Petr Pošík, Martin Hlinovský, Katarína Žmolíková, Ivan Jelínek Ivan Jelínek (Gar.)	KZ	6		Z,L	Р
B4M01TAL	Theory of Algorithms Marie Demlová, Natalie Žukovec Marie Demlová Marie Demlová (Gar.)	Z,ZK	6	3P+2S	L	Р

Characteristics of the courses of this group of Study Plan: Code=2018_MOIP Name=Compulsory subjects of the programm

B4M35KO | Combinatorial Optimization

The goal is to show the problems and algorithms of combinatorial optimization (often called discrete optimization; there is a strong overlap with the term operations research). Following the courses on linear algebra, graph theory, and basics of optimization, we show optimization techniques based on graphs, integer linear programming, heuristics, approximation algorithms and state space search methods. We focus on application of optimization in stores, ground transportation, flight transportation, logistics, planning of human resources, scheduling in production lines, message routing, scheduling in parallel computers.

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B4M33PAL	Advanced algorithms	Z,ZK	6
Basic graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - pattern match			
B4MSVP	Software or Research Project	KZ	6
B4M01TAL	Theory of Algorithms	Z,ZK	6

The course brings theoretical background of the theory of algorithms with the focus at first on the time and space complexity of algorithms and problems, secondly on the correctness of algorithms. Further it is dealt with the theory of complexity; the classes P, NP, NP-complete, PSPACE and NPSPACE are treated and properties of them investigated. Probabilistic algorithms are studied and the classes RP and ZZP introduced.

Name of the block: Compulsory courses of the specialization

Minimal number of credits of the block: 36

The role of the block: PO

Code of the group: 2018 MOIPO4

Name of the group: Compulsory subjects of the branch

Requirement credits in the group: In this group you have to gain 36 credits

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

Credits in the group: 36 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B4M38AVS	Embedded Systems Application Jan Sobotka, Radek Sedlá ek Radek Sedlá ek (Gar.)	Z,ZK	6	2P+2L	L	РО
B4M36ESW	Effective Software Michal Sojka, David Šišlák David Šišlák (Gar.)	Z,ZK	6	2P+2C	L	РО
B4M34ISC	Systems on Chip Tomáš Teplý, Ji í Jakovenko, Vladimír Janí ek, Jan Novák Ji í Jakovenko Ji í Jakovenko (Gar.)	Z,ZK	6	2P+2L	Z	РО
B4M38KRP	Computer Interfaces Ji í Novák Ji í Novák Ji í Novák (Gar.)	Z,ZK	6	2P+2L	Z	РО
B4M35PAG	Parallel algorithms Pemysl Š cha Pemysl Š cha (Gar.)	Z,ZK	6	2P+2S	Z	PO
B4M35PAP	Advanced Computer Architectures Pavel Píša, Karel Ko í Pavel Píša Pavel Píša (Gar.)	Z,ZK	6	2P+2C	Z	РО

Characteristics of the courses of this group of Study Plan: Code=2018_MOIPO4 Name=Compulsory subjects of the branch

B4M38AVS	Embedded Systems Application	Z,ZK	6				
This course presents applications of embedded systems and their specifics. It is expected that the students have had a programming course, and thus the course is more oriented on							
explaining and describi	explaining and describing the blocks and functions of embedded systems and their use in signal processing, rather than writing code. After completing this course, students should						
have an overview of usability and power of available processors, and their peripherals, on the basis of which, they should be able to independently design embedded systems for a							
wide spectrum of applications.							
B4M36ESW	Effective Software	Z,ZK	6				

Within the course of Efficient software you will get familiar with the area of software and algorithm optimization under limited resources. The course is focused on the efficient usage of modern hardware architectures - multi-core and multi-processor systems with shared memory. Students will practically implement and use presented techniques in C and Java. Main topics are: code optimization, effective data structures and processor cache usage, data structures in multi-threaded applications and implementation of efficient network servers.

	·		
B4M34ISC	Systems on Chip	Z,ZK	6

Main responsibilities of integrated circuits designer; design abstraction levels - Y chart. Specification designation, feasibility study, criteria for technology and design kits selection.

Analogue and digital integrated systems design and simulation methodologies. Main features of application specific ICs - full custom design, gate arrays, standard cells, programmable array logic. Design aspects mobile and low power systems. Hardware Description languages (HDL). Logic and physical synthesis. Frond End and Back End design. Floorplanning, place and route, layout, parasitic extraction, time analysis, testbenche construction and verification.

B4M38KRP	Computer Interfaces	Z,ZK	6			
Students are acquainted with functional principles of computers and embedded systems communication interfaces and with a design of typical peripherals. Technologies like USB,						

PCI, and PCI Express, wired and wireless computer and sensor networks as well as industrial distributed systems like CAN and LIN are introduced. Project oriented laboratories will allow students to become familiar with implementation of communication hardware and software into the real devices, including their support in operating systems.

B4M35PAG	Parallel algorithms	Z,ZK	6
In the introductory lectu	res, we will focus on general approaches to design of parallel algorithms and their properties important for understanding the	fundamental prin	ciples of parallel

and distributed algorithms. Subsequently we will talk about fundamental parallel algorithms; typically, constituting cornerstones of algorithms for real-world problems. The laboratory exercise will be aimed at hardware platform commonly used in practice.

B4M35PAP

Advanced Computer Architectures

Z,ZK 6

Name of the block: Elective courses

Minimal number of credits of the block: 0

The role of the block: V

Code of the group: 2018_MOIH

Name of the group: Humanities subjects

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0M16FIL	Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)	Z,ZK	5	2P+2S	Z,L	V
B0M16HVT	History of science and technology 2 Marcela Efmertová, Jan Mikeš Marcela Efmertová (Gar.)	Z,ZK	5	2P+2S	Z,L	V
B0M16HSD1	History of economy and social studies Marcela Efmertová	Z,ZK	5	2P+2S	Z,L	V
B0M16PSM	Psychology Jan Fiala Jan Fiala (Gar.)	Z,ZK	5	2P+2S	Z,L	V
B0M16TEO	Theology Vladimír Sláme ka Vladimír Sláme ka (Gar.)	Z,ZK	5	2P+2S	Z,L	V

Characteristics of the courses of this group of Study Plan: Code=2018_MOIH Name=Humanities subjects

B0M16FIL		Z,ZK	5		
B0M16HVT	History of science and technology 2	Z,ZK	5		
This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and					
traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical					

engineers

BOM16HSD1 History of economy and social studies Z,ZK 5

This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries.

DOMACTEO Theology	B0M16PSM	Psychology	Z,ZK	5
BOWINTEO Theology	B0M16TEO	I heology	Z.ZN	5

This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which graws our civilization up.

Code of the group: MTV

Name of the group: Physical education

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
TVV	Physical education	Z	0	0+2	Z,L	V
A003TV	Physical Education Ji í Drnek	Z	2	0+2	L,Z	V
TV-V1	Physical education	Z	1	0+2	Z,L	V
TVV0	Physical education	Z	0	0+2	Z,L	V
TVKLV	Physical Education Course	Z	0	7dní	L	V
TVKZV	Physical Education Course	Z	0	7dní	Z	V

Characteristics of the courses of this group of Study Plan: Code=MTV Name=Physical education

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TVV	Physical education	Z	0		
A003TV	Physical Education	Z	2		
TV-V1	Physical education	Z	1		
TVV0	Physical education	Z	0		
TVKLV	Physical Education Course	Z	0		
TVKZV	Physical Education Course	Z	0		

Code of the group: 2018_MOIVOL Name of the group: Elective subjects

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

Credits in the group: 0

Note on the group:

~The offer of elective courses arranged by departments can be found on the website https://fel.cvut.cz/en/education/volitelne-predmety.html\\

List of courses of this pass:

Code	Name of the course	Completion	Credits
A003TV	Physical Education	Z	2
B0M16FIL	·	Z,ZK	5
B0M16HSD1	History of economy and social studies	Z,ZK	5
	with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and the social and cultural development and coexistence of the various ethnical groups in the Czech countries.	'	ts as well as
B0M16HVT	History of science and technology 2	Z,ZK	5
This subject traces	historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate studen	nts' interest in the	history and
traditions of the sub	oject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life a engineers	and the influence	of technical
B0M16PSM	Psychology	Z,ZK	5
B0M16TEO	Theology	Z,ZK	5
	des to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the	-	-
are gone through. T	he subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who	want to get know	Christianity
DAMOATAL	- religion from which graws our civilization up.	7.71/	
B4M01TAL	Theory of Algorithms	Z,ZK	6
_	theoretical background of the theory of algorithms with the focus at first on the time and space complexity of algorithms and problems, her it is dealt with the theory of complexity; the classes P, NP, NP-complete, PSPACE and NPSPACE are treated and properties of their algorithms are studied and the classes RP and ZZP introduced.	-	
B4M33PAL		Z,ZK	6
	Advanced algorithms graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - pa		0
B4M34ISC	Systems on Chip	Z,ZK	6
I	ties of integrated circuits designer; design abstraction levels - Y chart. Specification designation, feasibility study, criteria for technology	, ,	_
•	al integrated systems design and simulation methodologies. Main features of application specific ICs - full custom design, gate arrays, s	_	
array logic Design	n aspects mobile and low power systems. Hardware Description languages (HDL). Logic and physical synthesis. Frond End and Back	End design Floo	rplanning,
array logic. Doolgi		Ena acoign. 1 loc	
array logic. Doolgi	place and route, layout, parasitic extraction, time analysis, testbenche construction and verification.	End doorgin. 1 loo	
B4M35KO		Z,ZK	6
B4M35KO	place and route, layout, parasitic extraction, time analysis, testbenche construction and verification.	Z,ZK	6
B4M35KO The goal is to show the courses on lir	place and route, layout, parasitic extraction, time analysis, testbenche construction and verification. Combinatorial Optimization the problems and algorithms of combinatorial optimization (often called discrete optimization; there is a strong overlap with the term opnear algebra, graph theory, and basics of optimization, we show optimization techniques based on graphs, integer linear programming	Z,ZK erations research , heuristics, appro	6 n). Following oximation
B4M35KO The goal is to show the courses on lir	place and route, layout, parasitic extraction, time analysis, testbenche construction and verification. Combinatorial Optimization the problems and algorithms of combinatorial optimization (often called discrete optimization; there is a strong overlap with the term op	Z,ZK erations research , heuristics, appro	6 n). Following oximation
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B4M35KO The goal is to show the courses on lir algorithms and st	place and route, layout, parasitic extraction, time analysis, testbenche construction and verification. Combinatorial Optimization the problems and algorithms of combinatorial optimization (often called discrete optimization; there is a strong overlap with the term op near algebra, graph theory, and basics of optimization, we show optimization techniques based on graphs, integer linear programming tate space search methods. We focus on application of optimization in stores, ground transportation, flight transportation, logistics, plan scheduling in production lines, message routing, scheduling in parallel computers.	Z,ZK perations research perations research perations research perations research perations research perations research	6 n). Following oximation esources,
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