

Study plan

Name of study plan: Open Informatics - Cyber Security

Faculty/Institute/Others: Faculty of Electrical Engineering

Department: Department of Computer Graphics and Interaction

Branch of study guaranteed by the department:

Garantor of the study branch: doc. Ing. David Šišlák, Ph.D.

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_MOIEP

Name of the group: Compulsory subjects of the programme

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
BE4M33PAL	Advanced Algorithms Marko Genyk-Berezovskij, Daniel Průša Daniel Průša Daniel Průša (Gar.)	Z,ZK	6	2P+2C	Z	P
BE4M35KO	Combinatorial Optimization Zdeněk Hanzálek Zdeněk Hanzálek	Z,ZK	6	3P+2C	L	P
BE4MSVP	Software or Research Project Petr Pošík, Jaroslav Sloup, Katarína Ťakušová Katarína Ťakušová	KZ	6		Z,L	P
BE4M01TAL	Theory of Algorithms Marie Demlová, Natalie Žukovec Marie Demlová Marie Demlová (Gar.)	Z,ZK	6	3P+2S	L	P

Characteristics of the courses of this group of Study Plan: Code=2018_MOIEP Name=Compulsory subjects of the programme

BE4M33PAL	Advanced Algorithms	Z,ZK	6
Basic graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - pattern matching.			
BE4M35KO	Combinatorial Optimization	Z,ZK	6
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.			
BE4MSVP	Software or Research Project	KZ	6
BE4M01TAL	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 ZPP introduced.			

Code of the group: 2018_MOIEDIP

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	P

Characteristics of the courses of this group of Study Plan: Code=2018_MOIEDIP 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 be 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.		
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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_MOIEPO2

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
BE2M32PST	Advanced Networking Technologies Leoš Boháč Zbyněk Kocur Leoš Boháč (Gar.)	Z,ZK	6	2P + 2L	Z,L	PO
BE4M36KBE	Communications Security	Z,ZK	6	3P+2C	Z	PO
BE4M36BSY	Introduction to Computer Security Tomáš Pevný Tomáš Pevný Tomáš Pevný (Gar.)	Z,ZK	6	2P+2C	Z	PO
BE4M01MKR	Mathematical Cryptography	Z,ZK	6	4P+2S	L	PO
BE4M36ZKS	Software Quality Assurance Miroslav Bureš, Karel Frajták, Václav Rechtberger Miroslav Bureš Miroslav Bureš (Gar.)	Z,ZK	6	2P+2C	Z	PO
BE4M36SAN	Statistical data analysis Jiří Kléma Jiří Kléma Jiří Kléma (Gar.)	Z,ZK	6	2P+2C	Z	PO

Characteristics of the courses of this group of Study Plan: Code=2018_MOIEPO2 Name=Compulsory subjects of the branch

BE2M32PST	Advanced Networking Technologies	Z,ZK	6	Subject Advanced Network Technologies extends student knowledge in an area of modern network technologies. The course strives to deepen student's knowledge in more advanced technical features of contemporary networking protocols in data networks. Students will get hands-on experience with topics like Internet unicast routing, multicast routing, IPv6 and design of MPLS networks using various network simulation tools.		
BE4M36KBE	Communications Security	Z,ZK	6			
BE4M36BSY	Introduction to Computer Security	Z,ZK	6	The aim of this course is to acquaint students with current security risks of operating systems and web applications, such as getting access through the network and escalation of rights. Students will gain an overview of the principles of operating systems administration minimizing security risks, writing safe applications and verifying their security, setting up firewalls and forensic analysis of already infected systems.		
BE4M01MKR	Mathematical Cryptography	Z,ZK	6	The lecture will set mathematical foundations of modern cryptography (RSA, El-Gamal, elliptic curve cryptography, hashing). Also, the related algorithms for primality testing (numbers sieves) and discrete logarithms will be treated.		
BE4M36ZKS	Software Quality Assurance	Z,ZK	6			
BE4M36SAN	Statistical data analysis	Z,ZK	6	This course builds on the skills developed in introductory statistics courses. It is practically oriented and gives an introduction to applied statistics. It mainly aims at multivariate statistical analysis and modelling, i.e., the methods that help to understand, interpret, visualize and model potentially high-dimensional data. It can be seen as a purely statistical counterpart to machine learning and data mining courses.		

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_MOIEVOL

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: ~Student can choose arbitrary subject of the master's program (EEM - Electrical Engineering, Power Engineering and Management, EK - Electronics and Communications, KYR - Cybernetics and Robotics, OI - Open Informatics, OES - Open Electronics Systems) which is not part of his curriculum. Student can choose with consideration of recommendation of the branch guarantee. You can find a selection of optional courses organized by the departments on the web site <http://www.fel.cvut.cz/cz/education/volitelne-predmety.html>

List of courses of this pass:

Code	Name of the course	Completion	Credits
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 be 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.			
BE2M32PST	Advanced Networking Technologies	Z,ZK	6
Subject Advanced Network Technologies extends student knowledge in an area of modern network technologies. The course strives to deepen student's knowledge in more advanced technical features of contemporary networking protocols in data networks. Students will get hands-on experience with topics like Internet unicast routing, multicast routing, IPv6 and design of MPLS networks using various network simulation tools.			
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BE4M01TAL	Theory of Algorithms	Z,ZK	6
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BE4M33PAL	Advanced Algorithms	Z,ZK	6
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BE4M35KO	Combinatorial Optimization	Z,ZK	6
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BE4M36BSY	Introduction to Computer Security	Z,ZK	6
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BE4M36KBE	Communications Security	Z,ZK	6
BE4M36SAN	Statistical data analysis	Z,ZK	6
This course builds on the skills developed in introductory statistics courses. It is practically oriented and gives an introduction to applied statistics. It mainly aims at multivariate statistical analysis and modelling, i.e., the methods that help to understand, interpret, visualize and model potentially high-dimensional data. It can be seen as a purely statistical counterpart to machine learning and data mining courses.			
BE4M36ZKS	Software Quality Assurance	Z,ZK	6
BE4MSVP	Software or Research Project	KZ	6

For updated information see <http://bilakniha.cvut.cz/en/f3.html>

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