

# Recommended pass through the study plan

## Name of the pass: Specialization Cyber Security - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering

Department:

Pass through the study plan: Open Informatics - Cyber Security

Branch of study guaranteed by the department: Welcome page

Guarantor of the study branch:

Program of study: Open Informatics

Type of study: Follow-up master full-time

Note on the pass:

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, <b>authors</b> and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BEZM	<b>Safety in Electrical Engineering for a master's degree</b> Vladimír K la, Radek Havlí ek, Ivana Nová, Josef ernohous, Pavel Mlejnek <b>Radek Havlí ek</b> Vladimír K la (Gar.)	Z	0	2BP+2BC	Z	P
B4M33PAL	<b>Advanced algorithms</b> Marko Genyk-Berezovskyj, Daniel Pr ša <b>Daniel Pr ša</b> Daniel Pr ša (Gar.)	Z,ZK	6	2P+2C	Z	P
B4M36BSY	<b>Introduction to Computer Security</b> Tomáš Pevný, Veronica Valeros, Sebastián García, Ond ej Lukáš <b>Tomáš Pevný</b> Tomáš Pevný (Gar.)	Z,ZK	6	2P+2C	Z	PO
B2M32PST	<b>Advanced Networking Technologies</b> Leoš Bohá <b>Zbyn k Kocur</b> Leoš Bohá (Gar.)	Z,ZK	6	2P + 2C + 4D	Z	PO
B4M36SAN	<b>Statistical Data Analysis</b> Ji í Kléma <b>Ji í Kléma</b> Ji í Kléma (Gar.)	Z,ZK	6	2P+2C	Z	PO
2018_MOIVOL	<b>Volitelné odborné p edm ty</b>	Min. cours. 0	Min/Max 0/999			V

Number of semester: 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, <b>authors</b> and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B4M35KO	<b>Combinatorial Optimization</b> Zden k Hanzálek <b>Zden k Hanzálek</b> Zden k Hanzálek (Gar.)	Z,ZK	6	3P+2C	L	P
B4M01TAL	<b>Theory of Algorithms</b> Marie Demlová, Natalie Žukovec <b>Marie Demlová</b> Marie Demlová (Gar.)	Z,ZK	6	3P+2S	L	P
B4M36KBE	<b>Communications Security</b> Tomáš Van k <b>Peter Macejko</b> Tomáš Van k (Gar.)	Z,ZK	6	3P+2C	L	PO
B4M01MKR	<b>Mathematical Cryptography</b> Alena Gollová <b>Alena Gollová</b> Ji í Velebil (Gar.)	Z,ZK	6	4P+2S	L	PO
2018_MOIVOL	<b>Volitelné odborné p edm ty</b>	Min. cours. 0	Min/Max 0/999			V

Number of semester: 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, <b>authors</b> and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B4MSVP	<b>Software or Research Project</b> Ivan Jelínek, Jaroslav Sloup, Ji í Šebek, Martin Šipoš, Drahomíra Hejtmánová, Jana Zichová, Petr Pošík, Martin Hlinovský, Katarína Žmolíková, ..... <b>Ivan Jelínek</b> Ivan Jelínek (Gar.)	KZ	6		Z,L	P

B4M36ZKS	<b>Software Quality Assurance</b> <i>Feras Abdul Hadi Mustafa Daoud, Mat j Klíma, Karel Frajták, Miroslav Bureš</i> <b>Miroslav Bureš</b> Miroslav Bureš (Gar.)	Z,ZK	6	2P+2C	Z	PO
2018_MOIVOL	<b>Volitelné odborné p edm ty</b>	Min. cours. 0	Min/Max 0/999			V

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
BDIP25	<b>Diploma Thesis</b>	Z	25	22s	L	P
2018_MOIVOL	<b>Volitelné odborné p edm ty</b>	Min. cours. 0	Min/Max 0/999			V

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

Kód	Name of the group of courses and codes of members of this group (for specification see here or below the list of courses)	Completion	Credits	Scope	Semester	Role
<b>2018_MOIVOL</b>	<b>Volitelné odborné p edm ty</b>	Min. cours. 0	Min/Max 0/999			V

## List of courses of this pass:

Code	Name of the course	Completion	Credits
B2M32PST	<b>Advanced Networking Technologies</b> Subject Advanced Network Technologies expands students' knowledge of modern network technologies. The course is practically oriented and focused on explaining the function of advanced network protocols as used in modern data networks of today and tomorrow. Students will gain practical experience with the issues like Internet routing, software-defined networks, multicast routing, IPv6, and MPLS networks. Part of the course is also devoted to a detailed explanation of transport protocols TCP/UDP and a manner in which software applications can access transportation services of TCP/IP data networks.	Z,ZK	6
B4M01MKR	<b>Mathematical Cryptography</b> The lecture sets mathematical foundations of modern cryptography (RSA, El-Gamal, elliptic curve cryptography). Related algorithms for primality testing, number factorisation and discrete logarithm are treated as well.	Z,ZK	6
B4M01TAL	<b>Theory of Algorithms</b> 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.	Z,ZK	6
B4M33PAL	<b>Advanced algorithms</b> Basic graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - pattern matching.	Z,ZK	6
B4M35KO	<b>Combinatorial Optimization</b> 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.	Z,ZK	6
B4M36BSY	<b>Introduction to Computer Security</b> 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.	Z,ZK	6
B4M36KBE	<b>Communications Security</b> The course provides a complete source of information on the field of security of information systems and information technologies. The most of information in today's world is created, transferred, stored in electronic form so information security is very important part of it. On successful completion of this course, students should be able to define the cryptographic primitives symmetric / asymmetric encryption, digital signatures, cryptographic hash function, and message authentication codes. They should be able to explain the security features offered by the latest versions of the most important security protocols operating on the TCP/IP stack (IPsec, TLS, SSH, PGP) and describe known attacks against these security protocols.	Z,ZK	6
B4M36SAN	<b>Statistical Data Analysis</b> 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.	Z,ZK	6
B4M36ZKS	<b>Software Quality Assurance</b>	Z,ZK	6

B4MSVP	Software or Research Project	KZ	6
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.			
BEZM	Safety in Electrical Engineering for a master's degree	Z	0
The course provides for students of all programs periodic training guidelines for health and occupational safety and gives knowledge of electrical hazard of given branch of study. Students receive indispensable qualification according to the current Directive of the Dean.			

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

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