## Recomended pass through the study plan

## Name of the pass: Specialization Computer Graphics - Recommended pass through study

Faculty/Institute/Others: Faculty of Electrical Engineering Department: Pass through the study plan: Open Informatics - Computer Graphics Branch of study guranteed 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, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BEZM	Safety in Electrical Engineering for a master's degree Vladimír K la, Radek Havlí ek, Ivana Nová, Josef ernohous, Pavel Mlejnek Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	z	Ρ
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	Ρ
B4M39APG	Algorithms of Computer Graphics Ji í Žára, Ji í Bittner Ji í Žára Ji í Žára (Gar.)	Z,ZK	6	2P+2C	Z	PO
B4M39DPG	Data Structures for Computer Graphics Vlastimil Havran Vlastimil Havran Vlastimil Havran (Gar.)	Z,ZK	6	2P+2S	Z	PO
2018_MOIVOL	Volitelné odborné p edm ty	Min. cours.	Min/Max			
		0	0/999			v

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
B4M35KO	Combinatorial Optimization Zden k Hanzálek Zden k Hanzálek (Gar.)	Z,ZK	6	3P+2C	L	Ρ
B4M01TAL	<b>Theory of Algorithms</b> Marie Demlová, Natalie Žukovec <b>Marie Demlová</b> Marie Demlová (Gar.)	Z,ZK	6	3P+2S	L	Ρ
B4M33GVG	Geometry of Computer Vision and Graphics Torsten Sattler, Viktor Korotynskiy, Tomáš Pajdla Tomáš Pajdla Tomáš Pajdla (Gar.)	Z,ZK	6	2P+2C	L	PO
B4M39VIZ	Visualization Ladislav molík Ladislav molík Ladislav molík (Gar.)	Z,ZK	6	2P+2C	L	PO
2018_MOIVOL	Volitelné odborné p edm ty	Min. cours.	Min/Max			V
		0	0/999			v

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
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.)	ΚZ	6		Z,L	Ρ

B4M39MMA	Multimedia and Computer Animation Roman Berka, Ond ej Slabý Roman Berka Roman Berka (Gar.)	Z,ZK	6	2P+2L	Z	PO
B4M39VG	Computational Geometry Petr Felkel Petr Felkel Petr Felkel (Gar.)	Z,ZK	6	2P+2S	Z	PO
2018_MOIVOL	Volitelné odborné p edm ty	Min. cours.	Min/Max			V
		0	0/999			

Number of semes	ster: 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
BDIP25	Diploma Thesis	Z	25	22s	L	Р
2018_MOIVOL	Volitelné odborné p edm ty	Min. cours.	Min/Max			N/
		0	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
2018_MOIVOL	Volitelné odborné p edm ty	Min. cours.	Min/Max			
		0	0/999			v

## List of courses of this pass:

Code	Name of the course	Completion	Credits			
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.						
B4M33GVG	Geometry of Computer Vision and Graphics	Z,ZK	6			
We will explain fur	damentals of image and space geometry including Euclidean, affine and projective geometry, the model of a perspective camera, in	age transformatio	ns induced			
by camera motion	n, and image normalization for object recognition. The theory will be demonstrated on practical task of creating mosaics from images	, measuring the ge	ometry of			
objects by a cam	era, and reconstructing geometrical properties of objects from their projections. We will build on linear algebra and optimization and h	ay down foundation	n for other			
	subjects such as computational geometry, computer vision, computer graphics, digital image processing and recognition of objects	n images.				
B4M33PAL	Advanced algorithms	Z,ZK	6			
Basic	graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - p	battern matching.				
B4M35KO	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 o	perations research	1). Following			
the courses on li	near algebra, graph theory, and basics of optimization, we show optimization techniques based on graphs, integer linear programmin	g, heuristics, appr	oximation			
algorithms and st	ate space search methods. We focus on application of optimization in stores, ground transportation, flight transportation, logistics, pl	anning of human r	esources,			
	scheduling in production lines, message routing, scheduling in parallel computers.					
B4M39APG	Algorithms of Computer Graphics	Z,ZK	6			
In this course you v	vill get acquainted with basic problems and their solutions in computer graphics. The main topic of the course are graphics primitives i	n 2D and 3D for m	odeling and			
	rendering, color models, image representations, and basic photorealistic rendering algorithms.					
B4M39DPG	Data Structures for Computer Graphics	Z,ZK	6			
This course provide	s you with the fundamentals of data structures commonly used in computer graphics. In contrast to standard binary search trees used in	one dimension, th	e presented			
theory focuses on m	ultidimensional data used to describe 3D scenes. In addition to the theory, the course emphasizes individual and team projects, where the	ne importance and	advantages			
0	multidimensional data are demonstrated on practical examples. The students will gain practical experience through their own individ	ual projects.				
B4M39MMA	Multimedia and Computer Animation	Z,ZK	6			
The course is focus	sed on methods often applied in the area of computer animation. Studens will get an overview of algorithms and methods solving typ	ical problems of 30	) animation			
(inverse kinemat	ics, animation of human body, dynamics, etc.). Part of the course is devoted to principles used during creative work with sound. The l	ast part of lectures	s will give			
	information about methods and technologies used in movie production (MOCAP, stereoscopy, visual effects).					
B4M39VG	Computational Geometry	Z,ZK	6			
The goal of comput	ational geometry is analysis and design of efficient algorithms for determining properties and relations of geometric entities. The lecture	focuses on geome	etric search,			
point location, convex hull construction for sets of points in d-dimensional space, searching nearest neighbor points, computing intersection of polygonal areas, geometry of parallelograms.						
New directions in algorithmic design. Computational geometry is applied not only in geometric applications, but also in common database searching problems.						

B4M39VIZ	Visualization	Z,ZK	6				
In this course, you	In this course, you will get the knowledge of theoretical background for visualization and the application of visualization in real-world examples. The visualization methods are aimed						
at exploiting bot	h the full power of computer technologies and the characteristics (and limits) of human perception. Well-chosen visualization method	s can help to revea	al hidden				
dependencies in t	he data that are not evident at the first glance. This in turn enables a more precise analysis of the data, or provides a deeper insight	into the core of the	particular				
	problem represented by the data.						
B4MSVP	Software or Research Project	KZ	6				
BDIP25	Diploma Thesis	Z	25				
Independent final	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 b	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 <u>http://bilakniha.cvut.cz/en/f3.html</u> Generated: day 2025-06-12, time 13:42.