Study plan

Name of study plan: Open Informatics - Computer Graphics

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_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:

Note on the grou	p.					
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 Ond ej Drbohlav, Marko Genyk-Berezovskyj, Daniel Pr ša Daniel Pr ša Daniel Pr ša (Gar.)	Z,ZK	6	2P+2C	Z	Ρ
BE4M35KO	Combinatorial Optimization Zden k Hanzálek Zden k Hanzálek Zden k Hanzálek (Gar.)	Z,ZK	6	3P+2C	L	Р
BE4MSVP	Software or Research Project Ji í Šebek, Petr Pošík, Jaroslav Sloup, Katarína Žmolíková, Tomáš Drábek Petr Pošík	КZ	6		Z,L	Ρ
BE4M01TAL	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_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 manual science	atching.	
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 ter	m operations rese	earch). Following
the courses on linear al	gebra, graph theory, and basics of optimization, we show optimization techniques based on graphs, integer linear programmi	ng, heuristics, ap	proximation
algorithms and state sp	ace search methods. We focus on application of optimization in stores, ground transportation, flight transportation, logistics, p	lanning of humar	n resources,
scheduling in production	n lines, message routing, scheduling in parallel computers.		
BE4MSVP	Software or Research Project	KZ	6
Independent work on a	problem under the guidance of an advisor. Usually but not mandatory, the problem being solved is a subproblem of approach	ing diploma thesis	s and the project
advisor is the diploma th	nesis supervisor too. Therefore, we recommend choosing the topic of the diploma thesis at the beginning of the 3rd semester	and not underesti	mating its timely
selection. The topic of th	ie project should be relevant to the major branch of the study. The software and research project course must have a clearly d	efined output, suc	ch as a technical
report or a computer pro	gram. The output is defended, evaluated and graded. Important note: - By default, it is not possible to complete more than one	subject of this type	e An exception
may be granted by the g	guarantor of the major branch of the study. A possible reason for granting an exemption is that the work-project has a differen	t topic and is led I	by another
supervisor. A typical exa	ample is working on a project abroad. Note: The student enrolls in the course of SVP at the department of the supervisor. If the	e course does no	t list the course,
	13139 (variant A4M39SVP). The contact email in case of further questions: oi@fel.cvut.cz. More instructions for entering and	elaborating the p	roject can be
found on the website of	the Department of Computer Graphics and Interaction http://dcgi.felk.cvut.cz/cs/study/predmetprojekt.		
BE4M01TAL	Theory of Algorithms	Z,ZK	6
The course brings theor	etical background of the theory of algorithms with the focus at first on the time and space complexity of algorithms and probl	ems, 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	d. Probabilistic
algorithms are studied a	and the classes RP and ZZP 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	Р

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

BDIP25Diploma ThesisZ25Independent 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 tinal examiners.Z25

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_MOIEPO3

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
BE4M39APG	Algorithms of Computer Graphics Ji í Žára, Ji í Bittner Ji í Bittner Ji í Žára (Gar.)	Z,ZK	6	2P+2C	Z	PO
BE4M39VG	Computational Geometry Petr Felkel Petr Felkel (Gar.)	Z,ZK	6	2P+2S	Z	PO
BE4M39DPG	Data Structures for Computer Graphics Vlastimil Havran Vlastimil Havran Vlastimil Havran (Gar.)	Z,ZK	6	2P+2S	Z	PO
BE4M33GVG	Geometry of Computer Vision and Graphics Torsten Sattler, Viktor Korotynskiy, Tomáš Pajdla Tomáš Pajdla Tomáš Pajdla (Gar.)	Z,ZK	6	2P+2C	L	PO
BE4M39MMA	Multimedia and Computer Animation	Z,ZK	6	2P+2L	Z	PO
BE4M39VIZ	Visualization Ladislav molík Ladislav molík Ladislav molík (Gar.)	Z,ZK	6	2P+2C	L	PO

Characteristics of the courses of this group of Study Plan: Code=2018_MOIEPO3 Name=Compulsory subjects of the branch

BE4M39APG	Algorithms of Computer Graphics	Z,ZK	6
In this course you will g	et acquainted with basic problems and their solutions in computer graphics. The main topic of the course are graphics primitiv	es in 2D and 3D f	or modeling and
rendering, color models	, image representations, and basic photorealistic rendering algorithms.		
BE4M39VG	Computational Geometry	Z,ZK	6
The goal of computation	al geometry is analysis and design of efficient algorithms for determining properties and relations of geometric entities. The lec	ture focuses on g	eometric search,
point location, convex hu	Il construction for sets of points in d-dimensional space, searching nearest neighbor points, computing intersection of polygonal	areas, geometry o	f parallelograms.
New directions in algori	thmic design. Computational geometry is applied not only in geometric applications, but also in common database searching	problems.	
BE4M39DPG	Data Structures for Computer Graphics	Z,ZK	6
This course provides yo	u with the fundamentals of data structures commonly used in computer graphics. In contrast to standard binary search trees use	d in one dimensio	n, the presented
theory focuses on multic	limensional data used to describe 3D scenes. In addition to the theory, the course emphasizes individual and team projects, whe	re the importance	and advantages
of multidimensional data	a are demonstrated on practical examples. The students will gain practical experience through their own individual projects.		
BE4M33GVG	Geometry of Computer Vision and Graphics	Z,ZK	6
We will explain fundame	entals of image and space geometry including Euclidean, affine and projective geometry, the model of a perspective camera,	image transformation	ations induced
by camera motion, and	image normalization for object recognition. The theory will be demonstrated on practical task of creating mosaics from image	s, measuring the	geometry of
objects by a camera, ar	d reconstructing geometrical properties of objects from their projections. We will build on linear algebra and optimization and	lay down foundat	tion for other
subjects such as compu	itational geometry, computer vision, computer graphics, digital image processing and recognition of objects in images.		
BE4M39MMA	Multimedia and Computer Animation	Z,ZK	6
The course is focused of	n methods often applied in the area of computer animation. Studens will get an overview of algorithms and methods solving	typical problems	of 3D animation
(inverse kinematics, ani	mation of human body, dynamics, etc.). Part of the course is devoted to principles used during creative work with sound. The	last part of lectur	es will give
information about metho	ods and technologies used in movie production (MOCAP, stereoscopy, visual effects).		
BE4M39VIZ	Visualization	Z,ZK	6
In this course, you will g	et the knowledge of theoretical background for visualization and the application of visualization in real-world examples. The v	visualization meth	ods are aimed
at exploiting both the fu	Il power of computer technologies and the characteristics (and limits) of human perception. Well-chosen visualization method	s can help to reve	al hidden
dependencies in the da	ta that are not evident at the first glance. This in turn enables a more precise analysis of the data or provides a deeper insigh	t into the core of t	he particular
problem represented by	the data.		

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 an

Note on the group: ~Student can choose arbitrary subject of themagister'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:

	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 h	er branch of study	, which wil
be specified l	by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehe	ensive final examir	nation.
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	correctnes
of algorithms. Fur	ther it is dealt with the theory of complexity; the classes P, NP, NP-complete, PSPACE and NPSPACE are treated and properties of the	em investigated. P	robabilistic
	algorithms are studied and the classes RP and ZZP introduced.		
BE4M33GVG	Geometry of Computer Vision and Graphics	Z,ZK	6
We will explain fu	ndamentals of image and space geometry including Euclidean, affine and projective geometry, the model of a perspective camera, im	age transformatio	ns induced
by camera motio	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 la	ay down foundation	n for other
	subjects such as computational geometry, computer vision, computer graphics, digital image processing and recognition of objects	n images.	
BE4M33PAL	Advanced Algorithms	Z,ZK	6
Basic	graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - p	attern 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 o	perations research	n). Followin
the courses on li	inear algebra, graph theory, and basics of optimization, we show optimization techniques based on graphs, integer linear programming	g, heuristics, appr	oximation
algorithms and s	tate space search methods. We focus on application of optimization in stores, ground transportation, flight transportation, logistics, pla	anning of human r	esources,
	scheduling in production lines, message routing, scheduling in parallel computers.		
			-
BE4M39APG	Algorithms of Computer Graphics	Z,ZK	6
	Algorithms of Computer Graphics will get acquainted with basic problems and their solutions in computer graphics. The main topic of the course are graphics primitives in	,	-
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	will get acquainted with basic problems and their solutions in computer graphics. The main topic of the course are graphics primitives in rendering, color models, image representations, and basic photorealistic rendering algorithms.	,	-
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selection. The topic of the project should be relevant to the major branch of the study. The software and research project course must have a clearly defined output, such as a technical report or a computer program. The output is defended, evaluated and graded. Important note: - By default, it is not possible to complete more than one subject of this type. - An exception may be granted by the guarantor of the major branch of the study. A possible reason for granting an exemption is that the work-project has a different topic and is led by another supervisor. A typical example is working on a project abroad. Note: The student enrolls in the course of SVP at the department of the supervisor. If the course does not list the course, then at the department 13139 (variant A4M39SVP). The contact email in case of further questions: oi@fel.cvut.cz. More instructions for entering and elaborating the project can be found on the website of the Department of Computer Graphics and Interaction http://dcgi.felk.cvut.cz/cs/study/predmetprojekt.

For updated information see <u>http://bilakniha.cvut.cz/en/f3.html</u> Generated: day 2025-07-05, time 20:13.