

## Recommended pass through the study plan

### Name of the pass: Specialization Computer Games and Graphics - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering

Department: Department of Computer Graphics and Interaction

Pass through the study plan: Open Informatics - Computer Games and Graphics 2018

Branch of study guaranteed by the department:

Guarantor of the study branch:

Program of study: Open Informatics

Type of study: Bachelor 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 assessment, Z - assessment, 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
B4B01DMA	<b>Discrete Mathematics</b> Petr Habala Petr Habala Petr Habala (Gar.)	Z,ZK	5	2P+2S	Z	P
B0B01LAG	<b>Linear Algebra</b> Jiří Velebil, Kateřina Helisová, Josef Dvořák, Matěj Dostál Jiří Velebil (Gar.)	Z,ZK	8	4P+2S	Z	P
B0B36PRP	<b>Procedural Programming</b> Jan Faigl Jan Faigl Jan Faigl (Gar.)	Z,ZK	6	2P+2C	Z	P
BEZZ	<b>Basic health and occupational safety regulations</b> Vladimír Křel, Radek Havlíček, Ivana Nová Radek Havlíček Vladimír Křel (Gar.)	Z	0	2BP+2BC	Z	P
B4B33RPH	<b>Solving Problems and other Games</b> Tomáš Svoboda, Petr Pošík Tomáš Svoboda Tomáš Svoboda (Gar.)	KZ	6	2P+3C	Z	P
2018_BOIVOL	<b>Volitelné odborné předměty</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, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B35APO	<b>Computer Architectures</b>	Z,ZK	5	2P+2L	L	P
BEZB	<b>Safety in Electrical Engineering for a bachelor's degree</b> Vladimír Křel, Radek Havlíček, Ivana Nová Radek Havlíček Vladimír Křel (Gar.)	Z	0	2BP+2BC	Z,L	P
B0B01LGR	<b>Logic and Graphs</b> Matěj Dostál, Alena Gollová Matěj Dostál Marie Demlová (Gar.)	Z,ZK	5	3P+2S	Z,L	P
B0B01MA1	<b>Mathematical Analysis 1</b> Karel Pospíšil, Josef Tkadlec Josef Tkadlec (Gar.)	Z,ZK	7	4P+2S	Z,L	P
B4B38PSIA	<b>Computer Networks</b>	Z,ZK	5	2P+2L	L	P
B0B36PJV	<b>Programming in Java</b>	Z,ZK	6	2P+3C	L	P
2018_BOIVOL	<b>Volitelné odborné předměty</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, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B4B33ALG	<b>Algorithms</b> Marko Genyk-Berezovskij, Daniel Pr ša <b>Daniel Pr ša</b> Marko Genyk-Berezovskij (Gar.)	Z,ZK	6	2P+2C	Z	P
B0B01MA2	<b>Mathematical Analysis 2</b> Paola Vivi, Petr Hájek, Miroslav Korbela , Martin K epela <b>Petr Hájek</b> Jaroslav Tišer (Gar.)	Z,ZK	7	4P+2S	L,Z	P
B4B35OSY	<b>Operating Systems</b> Michal Sojka, Petr Št pán <b>Michal Sojka</b> Michal Sojka (Gar.)	Z,ZK	4	2P+2C	Z	P
B0B01PST	<b>Probability and Statistics</b> Miroslav Korbela , Mirko Navara, Mat j Novotný, Milan Petrík <b>Petr Hájek</b> Petr Hájek (Gar.)	Z,ZK	7	4P+2S	Z,L	P
B4B39HRY	<b>Computer Games</b> Ji í Bittner, David Sedlá ek <b>David Sedlá ek</b> Ji í Bittner (Gar.)	Z,ZK	6	2P+2C	Z	PZ

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B36DBS	<b>Database Systems</b>	Z,ZK	6	2P+2C	L	P
B0B33OPT	<b>Optimization</b> Tomáš Werner, Petr Olšák Tomáš Werner (Gar.)	Z,ZK	7	4P+2C	Z,L	P
B4B36PDV	<b>Parallel and Distributed Computing</b>	Z,ZK	6	2P+2C	L	P
B0B39PGR	<b>Computer graphics programming</b> Jaroslav Sloup	Z,ZK	6	2P+2C	L	PZ
B4B36ZUI	<b>Introduction to Artificial Intelligence</b>	Z,ZK	6	2P+2C	L	PZ

Number of semester: 5

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
B4BPROJ6	<b>Unassisted project</b> Tomáš Svoboda, Petr Pošík, Ji í Šebek, Jaroslav Sloup, Ivan Jelínek, Katarína akušová <b>Petr Pošík</b>	Z	6	0+2		P
B4B39IUR	<b>User interfaces implementation</b> Zden k Míkovec, Miroslav Macík <b>Miroslav Macík</b> Zden k Míkovec (Gar.)	Z,ZK	6	2P+2S	Z	PZ
B4B39VGO	<b>Creation of Graphics Contents</b>	Z,ZK	6	2P+2C	Z	PZ
2018_BOIVOL	<b>Volitelné odborné p edm ty</b>	Min. cours. 0	Min/Max 0/999			V

Number of semester: 6

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
BBAP20	<b>Bachelor thesis</b>	Z	20	0+12	L,Z	P
2018_BOIVOL	<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
2018_BOIVOL	<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
B0B01LAG	Linear Algebra	Z,ZK	8
B0B01LGR	Logic and Graphs	Z,ZK	5
This course covers basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The importance of the notion of semantic consequence and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced.			
B0B01MA1	Mathematical Analysis 1	Z,ZK	7
The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.			
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series.			
B0B01PST	Probability and Statistics	Z,ZK	7
Basics of probability theory and mathematical statistics. Includes descriptions of probability, random variables and their distributions, characteristics and operations with random variables. Basics of mathematical statistics: Point and interval estimates, methods of parameters estimation and hypotheses testing, least squares method. Basic notions and results of the theory of Markov chains.			
B0B33OPT	Optimization	Z,ZK	7
The course provides the basics of mathematical optimization: using linear algebra for optimization (least squares, SVD), Lagrange multipliers, selected numerical algorithms (gradient, Newton, Gauss-Newton, Levenberg-Marquardt methods), linear programming, convex sets and functions, intro to convex optimization, duality.			
B0B35APO	Computer Architectures	Z,ZK	5
B0B36DBS	Database Systems	Z,ZK	6
B0B36PJV	Programming in Java	Z,ZK	6
B0B36PRP	Procedural Programming	Z,ZK	6
B0B39PGR	Computer graphics programming	Z,ZK	6
B4B01DMA	Discrete Mathematics	Z,ZK	5
In this course students meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, diophantine equations, binary relations, induction, cardinality of sets, and recurrence equations. The second aim of this course is to teach students the language of mathematics, both passively and actively, and introduce them to mathematics as science.			
B4B33ALG	Algorithms	Z,ZK	6
In the course, the algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars are based on Java. Basic data types a data structures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms, Dynamic programming. Students are able to design and construct non-trivial algorithms and to evaluate their effectivity.			
B4B33RPH	Solving Problems and other Games	KZ	6
The main motivation is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose the big problem, how to define interfaces, how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problem will not be solved in the optimal way. The unsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Ideally, at the end of the subject, the student should be eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for writing readable and robust codes.			
B4B35OSY	Operating Systems	Z,ZK	4
Lecture introduces operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, drivers, file systems, basic security aspects. These topics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in C programming language will be solved on labs. Students will work with Linux OS and micro-kernel NOVA.			
B4B36PDV	Parallel and Distributed Computing	Z,ZK	6
B4B36ZUI	Introduction to Artificial Intelligence	Z,ZK	6
B4B38PSIA	Computer Networks	Z,ZK	5
B4B39HRY	Computer Games	Z,ZK	6
Students familiarize themselves with the issues encountered during programming computer games. They learn topics such as 3D model representation, animations, collision detection, physical simulation, and real-time rendering in the context of computer games development. During exercises they will develop a computer game in teams: from the game concept and design document, through programming game mechanics to the presentation in front of a jury of experts. The exercises are build around the Unity framework.			
B4B39IUR	User interfaces implementation	Z,ZK	6
Based on the user interface specification (created by design team), the student will be able to implement user interface and communicate efficiently with other stakeholders taking part in the whole process of design, testing, and implementation of the user interface.			
B4B39VGO	Creation of Graphics Contents	Z,ZK	6
The aim of this course is to give to students overview of methods to create 2D and 3D graphics content and how to apply those methods in praxis. Students will learn how to design and create three-dimensional scene, create and apply textures imitating materials (e.g., wall finishes, wood, sky) and geometrical details, and position and set-up lights in the scene. Student will also learn the terminology used in computer graphics.			
B4BPROJ6	Unassisted project	Z	6
BBAP20	Bachelor thesis	Z	20
BEZB	Safety in Electrical Engineering for a bachelor's degree	Z	0
The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.			

BEZZ

Basic health and occupational safety regulations

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The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague, which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety regulations forms an integral and permanent part of qualification requirements. This program is obligatory.

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

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