

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_MOIDIP

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_MOIDIP 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. | | | | | | |

Code of the group: 2018_MOIP

Name of the group: Compulsory subjects of the program

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 |
|----------|---|------------|---------|-------|----------|------|
| B4M35KO | Combinatorial Optimization Zden k Hanzálek Zden k Hanzálek Zden k Hanzálek (Gar.) | Z,ZK | 6 | 3P+2C | L | P |
| B4M33PAL | Advanced algorithms Marko Genyk-Berezovskij, Daniel Pr ša, Ond ej Drbohlav Daniel Pr ša Daniel Pr ša (Gar.) | Z,ZK | 6 | 2P+2C | Z | P |
| 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.) | KZ | 6 | | Z,L | P |
| B4M01TAL | 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_MOIP Name=Compulsory subjects of the program

| | | | |
|---|------------------------------|------|---|
| 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 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. | | | |
| B4M33PAL | Advanced algorithms | Z,ZK | 6 |
| Basic graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - pattern matching. | | | |
| B4MSVP | Software or Research Project | KZ | 6 |
| 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 ZPP introduced. | | | |

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_MOIPO3

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 |
|----------|---|------------|---------|-------|----------|------|
| 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 |
| 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 |
| B4M39MMA | Multimedia and Computer Animation Roman Berka, Ondřej Slabý Roman Berka Roman Berka (Gar.) | Z,ZK | 6 | 2P+2L | Z | PO |
| B4M39VIZ | Visualization Ladislav molík Ladislav molík Ladislav molík (Gar.) | Z,ZK | 6 | 2P+2C | L | PO |
| B4M39VG | Computational Geometry Petr Felkel Petr Felkel Petr Felkel (Gar.) | Z,ZK | 6 | 2P+2S | Z | PO |

Characteristics of the courses of this group of Study Plan: Code=2018_MOIPO3 Name=Compulsory subjects of the branch

| | | | |
|--|--|------|---|
| B4M39APG | Algorithms of Computer Graphics | Z,ZK | 6 |
| In this course you will get acquainted with basic problems and their solutions in computer graphics. The main topic of the course are graphics primitives in 2D and 3D for modeling and rendering, color models, image representations, and basic photorealistic rendering algorithms. | | | |
| B4M39DPG | Data Structures for Computer Graphics | Z,ZK | 6 |
| This course provides you with the fundamentals of data structures commonly used in computer graphics. In contrast to standard binary search trees used in one dimension, the presented theory focuses on multidimensional data used to describe 3D scenes. In addition to the theory, the course emphasizes individual and team projects, where the importance and advantages of multidimensional data are demonstrated on practical examples. The students will gain practical experience through their own individual projects. | | | |
| B4M33GVG | Geometry of Computer Vision and Graphics | Z,ZK | 6 |
| We will explain fundamentals of image and space geometry including Euclidean, affine and projective geometry, the model of a perspective camera, image transformations induced by camera motion, and image normalization for object recognition. The theory will be demonstrated on practical task of creating mosaics from images, measuring the geometry of objects by a camera, and reconstructing geometrical properties of objects from their projections. We will build on linear algebra and optimization and lay down foundation for other subjects such as computational geometry, computer vision, computer graphics, digital image processing and recognition of objects in images. | | | |
| B4M39MMA | Multimedia and Computer Animation | Z,ZK | 6 |
| The course is focused on methods often applied in the area of computer animation. Students will get an overview of algorithms and methods solving typical problems of 3D animation (inverse kinematics, animation of human body, dynamics, etc.). Part of the course is devoted to principles used during creative work with sound. The last part of lectures will give information about methods and technologies used in movie production (MOCAP, stereoscopy, visual effects). | | | |
| B4M39VIZ | Visualization | Z,ZK | 6 |
| 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 both the full power of computer technologies and the characteristics (and limits) of human perception. Well-chosen visualization methods can help to reveal hidden dependencies in the 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. | | | |
| B4M39VG | Computational Geometry | Z,ZK | 6 |
| The goal of computational geometry is analysis and design of efficient algorithms for determining properties and relations of geometric entities. The lecture focuses on geometric 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. | | | |

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_MOIH

Name of the group: Humanities subjects

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

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 |
|-----------|---|------------|---------|-------|----------|------|
| B0M16FIL | Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.) | Z,ZK | 5 | 2P+2S | Z,L | v |
| B0M16HVT | History of science and technology 2 Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.) | Z,ZK | 5 | 2P+2S | Z,L | v |
| B0M16HSD1 | History of economy and social studies Marcela Efmertová | Z,ZK | 5 | 2P+2S | Z,L | v |
| B0M16PSM | Psychology Jan Fiala Jan Fiala Jan Fiala (Gar.) | Z,ZK | 5 | 2P+2S | Z,L | v |
| B0M16TEO | Theology Vladimír Sláma ka Vladimír Sláma ka Vladimír Sláma ka (Gar.) | Z,ZK | 5 | 2P+2S | Z,L | v |

Characteristics of the courses of this group of Study Plan: Code=2018_MOIH Name=Humanities subjects

| | | | |
|-----------|---|------|---|
| B0M16FIL | | Z,ZK | 5 |
| B0M16HVT | History of science and technology 2 This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical engineers | Z,ZK | 5 |
| B0M16HSD1 | History of economy and social studies This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries. | Z,ZK | 5 |
| B0M16PSM | Psychology | Z,ZK | 5 |
| B0M16TEO | Theology This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which grows our civilization up. | Z,ZK | 5 |

Code of the group: MTV

Name of the group: Physical education

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

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 |
|--------|---|------------|---------|-------|----------|------|
| TVV | Physical education | Z | 0 | 0+2 | Z,L | v |
| A003TV | Physical Education Jiří Drnek | Z | 2 | 0+2 | L,Z | v |
| TV-V1 | Physical education | Z | 1 | 0+2 | Z,L | v |
| TVV0 | Physical education | Z | 0 | 0+2 | Z,L | v |
| TVKLV | Physical Education Course | Z | 0 | 7dní | L | v |
| TVKZV | Physical Education Course | Z | 0 | 7dní | Z | v |

Characteristics of the courses of this group of Study Plan: Code=MTV Name=Physical education

| | | | |
|--------|---------------------------|---|---|
| TVV | Physical education | Z | 0 |
| A003TV | Physical Education | Z | 2 |
| TV-V1 | Physical education | Z | 1 |
| TVV0 | Physical education | Z | 0 |
| TVKLV | Physical Education Course | Z | 0 |
| TVKZV | Physical Education Course | Z | 0 |

Code of the group: 2018_MOIVOL
 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:

~The offer of elective courses arranged by departments can be found on the website
<https://fel.cvut.cz/en/education/volitelne-predmety.html>

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|-----------|--|------------|---------|
| A003TV | Physical Education | Z | 2 |
| B0M16FIL | | Z,ZK | 5 |
| B0M16HSD1 | History of economy and social studies This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries. | Z,ZK | 5 |
| B0M16HVT | History of science and technology 2 This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical engineers | Z,ZK | 5 |
| B0M16PSM | Psychology | Z,ZK | 5 |
| B0M16TEO | Theology This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which grows our civilization up. | Z,ZK | 5 |
| B4M01TAL | Theory of Algorithms 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. | Z,ZK | 6 |
| B4M33GVG | Geometry of Computer Vision and Graphics We will explain fundamentals of image and space geometry including Euclidean, affine and projective geometry, the model of a perspective camera, image transformations induced by camera motion, and image normalization for object recognition. The theory will be demonstrated on practical task of creating mosaics from images, measuring the geometry of objects by a camera, and reconstructing geometrical properties of objects from their projections. We will build on linear algebra and optimization and lay down foundation for other subjects such as computational geometry, computer vision, computer graphics, digital image processing and recognition of objects in images. | Z,ZK | 6 |
| B4M33PAL | Advanced algorithms Basic graph algorithms and graph representation. Combinatorial algorithms. Application of formal languages theory in computer science - pattern matching. | Z,ZK | 6 |
| B4M35KO | Combinatorial Optimization 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 |
| B4M39APG | Algorithms of Computer Graphics In this course you will get acquainted with basic problems and their solutions in computer graphics. The main topic of the course are graphics primitives in 2D and 3D for modeling and rendering, color models, image representations, and basic photorealistic rendering algorithms. | Z,ZK | 6 |
| B4M39DPG | Data Structures for Computer Graphics This course provides you with the fundamentals of data structures commonly used in computer graphics. In contrast to standard binary search trees used in one dimension, the presented theory focuses on multidimensional data used to describe 3D scenes. In addition to the theory, the course emphasizes individual and team projects, where the importance and advantages of multidimensional data are demonstrated on practical examples. The students will gain practical experience through their own individual projects. | Z,ZK | 6 |
| B4M39MMA | Multimedia and Computer Animation The course is focused on methods often applied in the area of computer animation. Students will get an overview of algorithms and methods solving typical problems of 3D animation (inverse kinematics, animation of human body, dynamics, etc.). Part of the course is devoted to principles used during creative work with sound. The last part of lectures will give information about methods and technologies used in movie production (MOCAP, stereoscopy, visual effects). | Z,ZK | 6 |
| B4M39VG | Computational Geometry The goal of computational geometry is analysis and design of efficient algorithms for determining properties and relations of geometric entities. The lecture focuses on geometric 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. | Z,ZK | 6 |
| B4M39VIZ | Visualization 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 both the full power of computer technologies and the characteristics (and limits) of human perception. Well-chosen visualization methods can help to reveal hidden dependencies in the 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. | 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. | | | |
| TV-V1 | Physical education | Z | 1 |
| TVKLV | Physical Education Course | Z | 0 |
| TVKZV | Physical Education Course | Z | 0 |
| TVV | Physical education | Z | 0 |
| TVV0 | Physical education | Z | 0 |

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

Generated: day 2025-04-08, time 23:46.