**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ABSP/14 | **Course name:** Essentials of ABAP |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II.

**Prerequisities:** ÚINF/ZTSP/14

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Principles of programming in ABAP, declaration of variables, the basic syntax of the language ABAP Open SQL, ABAP Workbench navigation, ABAP editor, arithmetic, logic conditions, string operations, cycles, test programs using a debugger, an overview of the most important commands of ABAP, definition elementary and structured data objects, functional groups and function modules.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 40

| abs | n |
|---|---|
| 95.0 | 5.0 |

**Provides:** RNDr. Štefan Pero

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

<table>
<tr><td colspan="6">University: P. J. Šafárik University in Košice</td></tr>
<tr><td colspan="6">Faculty: Faculty of Science</td></tr>
<tr><td>Course ID: ÚINF/ AEO1/15</td><td colspan="5">Course name: Legal aspects of electronic commerce</td></tr>
<tr><td colspan="6">Course type, scope and the method:<br>Course type: Lecture<br>Recommended course-load (hours):<br>Per week: 2 Per study period: 28<br>Course method: present</td></tr>
<tr><td colspan="6">Number of credits: 3</td></tr>
<tr><td colspan="6">Recommended semester/trimester of the course: 2., 4.</td></tr>
<tr><td colspan="6">Course level: I., II.</td></tr>
<tr><td colspan="6">Prerequisities:</td></tr>
<tr><td colspan="6">Conditions for course completion:</td></tr>
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<tr><td colspan="6">Brief outline of the course:</td></tr>
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<tr><td colspan="6">Course language:</td></tr>
<tr><td colspan="6">Course assessment<br>Total number of assessed students: 0</td></tr>
<tr><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>FX</td></tr>
<tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr>
<tr><td colspan="6">Provides: doc. JUDr. Regina Hučková, PhD., doc. RNDr. Jozef Jirásek, PhD.</td></tr>
<tr><td colspan="6">Date of last modification: 09.02.2017</td></tr>
<tr><td colspan="6">Approved: Guaranteeprof. RNDr. Viliam Geffert, DrSc.</td></tr>
</table>

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ AFJ1b/15 | **Course name:** Automata and formal languages |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1.

**Course level:** I., II.

**Prerequisities:** ÚINF/AFJ1a/15

**Conditions for course completion:**
Test and oral examination.

**Learning outcomes:**
To provide theoretical background for studying computer science in general, by giving the necessary knowledge in theory of automata.

**Brief outline of the course:**
Chomsky and Greibach normal forms of context free gramars. Pushdown automata. Pumping lemma. Closure properties of context free and deterministic context free languages. Context sensitive grammars and linearly-bounded Turing machines. Phrase-structure grammars and Turing machines. Post correspondence problem. Undecidable problems in the theory of formal languages.

**Recommended literature:**
J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2001.
J. Shallit: A second course in formal languages and automata theory, Cambridge University press, 2009.
M. Sipser: Introduction to the theory of computation, Thomson Course Technology, 2006.

**Course language:**

**Course assessment**
Total number of assessed students: 525

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 37.9 | 14.86 | 19.81 | 18.29 | 6.48 | 2.67 |

**Provides:** prof. RNDr. Viliam Geffert, DrSc., Mgr. Alexander Szabari, PhD., RNDr. Zuzana Bednárová, PhD.

**Date of last modification:** 06.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** KFaDF/AFS/05 | **Course name:** Ancient Philosophy and Present Times |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 31

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 80.65 | 6.45 | 6.45 | 0.0 | 6.45 | 0.0 |

**Provides:** Doc. PhDr. Peter Nezník, CSc.

**Date of last modification:** 24.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ AIS1/15 | **Course name:** Information systems architecture |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Work on project.
Written and oral examination

**Learning outcomes:**
To provide an overview of the modern methodologies of information system development. To introduce the fundamental principles of conceptual modelling of information systems.

**Brief outline of the course:**
System, information system, information pyramid. Conceptualisation of information systems. ISO model of the architecture of an information system. Introduction to MDA, software development life cycle based on MDA. Model, metamodel, modelling language. Model transformation and marking models. Entity types. Relationship types. Cardinality constraints. Integrity constraints. Taxonomies. Domain events. Use cases. State transition diagrams.

**Recommended literature:**
1. http://www.omg.org
2. Ian Sommerville, Software Engineering, Addison-Wesley 2005
3. Anneke Kleppe, Wim Bast, Jos B Warmer, MDA Explained, the Model Driven Architecture, Addison-Wesley 2003
4. Scott Berkun, The Art Of Project Management, O Reilly 2005

**Course language:**

**Course assessment**
Total number of assessed students: 173

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 19.65 | 30.64 | 25.43 | 9.25 | 11.56 | 3.47 |

**Provides:** doc. RNDr. Gabriel Semanišin, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/ ALG3b/10 | **Course name:** Algebra II for informaticians and physicists |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 4 / 2 **Per study period:** 56 / 28
**Course method:** present

**Number of credits:** 7

**Recommended semester/trimester of the course:** 2.

**Course level:** I., II.

**Prerequisities:** ÚMV/ALGa/10

**Conditions for course completion:**
Exam

**Learning outcomes:**
To provide deeper knowledge on vector spaces, linear transformations and Euclidean spaces.

**Brief outline of the course:**
Vector spaces, subspaces. A basis, a dimension and a characterization of n-dimensional vector spaces. The rank of a matrix. Linear transformations and their matrices. Operations with linear tranformations, matrices of sums and compositions of linear tranformations. Regular linear transformations, regular matrices. Similar matrices. Characteristic vectors and characteristic values of linear transformations.
Affine spaces, subspaces and their positions. Euclidean spaces, the distance of subspaces. Conics and quadrics.

**Recommended literature:**
A. F. Beardon: Algebra and Geometry, Cambridge University Press, 2005
G. Birkhoff, S. Mac Lane: A Survey of Modern Algebra, New York 1965

**Course language:**
Slovak

**Course assessment**
Total number of assessed students: 324

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 11.73 | 8.95 | 9.88 | 15.43 | 40.43 | 13.58 |

**Provides:** doc. RNDr. Roman Soták, PhD., RNDr. Mária Maceková, PhD.

**Date of last modification:** 22.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ANO/15 | **Course name:** Image analysis |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 20

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 15.0 | 20.0 | 25.0 | 5.0 | 35.0 | 0.0 |

**Provides:** doc. Ing. Zoltán Tomori, CSc., doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ANP/15 | **Course name:** Algorithmic unsolved problems |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To introduce the student into most important results about non-existence of an algorithm for solving given problem.

**Brief outline of the course:**
Axiomatic theories of natural numbers. Definibality of recursive functions. Tarski theorem on undefinability of truth in formalized arithmethic. Godel incompletness theorem.
Algorithmic unsolvability of particular mathematical problems. Non-existence of an algorithm for deciding the existence of a solution of Diophantine equations. Reduction of problems and degrees of unsolvability.

**Recommended literature:**
J. Barwise ed., Handbook of Mathematical Logic, North Holland 1977S. C. Kleene, Introduction to the Metamathematics, Van Nostrand 1952, ruský preklad Moskva 1957.
E. Mendelson, Introduction to Mathematical Logic, Van Nostrand 1963, ruský preklad Nauka Moskva 1976.
M. Davis, Hilbert's Tenth Problem is Unsolvable, Amer. Math. Monthly,1973, 233--269.
Ju.V. Matijasevič, Diofantovy Množestva, Usp. Mat. Nauk, 27 (1972), 185--222
L. Bukovský, Algoritmicky neriešiteľné problémy, učebný text v elektronickej forma na sieti Novel, PF UPJŠ, Košice, 2003

**Course language:**

**Course assessment**
Total number of assessed students: 12

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ AOS1/15 | **Course name:** Administration of OS |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To be able to install Linux based system, divide disks, to know how to install, configure and manage several network deamons.

**Brief outline of the course:**
1. Introduction to network services
2. SSH
3. Routing and NAT
4. Introduction to Firewall
5. Advanced firewall settings
6. DHCP server
7. Web server (apache, php, mysql)
8. Monitoring Server (SNMP, MRTG)
9. Samba Server
10. Mail server (smtp, imap, postfix)
11. Proxy server
12. Windows server
13. Windows Server II.
14. Introduction to Virtualization (Hyper-V OpenVZ)

**Recommended literature:**
1. Linux Documentation Project, 4 updated edition. Brno: Computer Press (2008).
2. Stanek, W.: Windows Server 2012 Inside Out. Microsoft Press (2013)
3. Shah, S. Soyinka, W. Administration Linux. Grade (2007)
4. Nemeth, E., et al.: Linux. Brno: Computer Press (2008)

**Course language:**

**Course assessment**
Total number of assessed students: 83

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 51.81 | 24.1 | 6.02 | 4.82 | 7.23 | 6.02 |

| |
|---|
| **Provides:** RNDr. JUDr. Pavol Sokol, PhD., RNDr. PhDr. Peter Pisarčík |
| **Date of last modification:** 07.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/APA1/15 | **Course name:** Approximation algorithms |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To learn basic conceptions of randomized algorithms and to classify the algorithms due to their error probability.

**Brief outline of the course:**
Basic notions of Probability Theory. Basic randomized computing models and its characterisations. Las Vegas algorithms. One sided error Monte Carlo algorithms. Two sided bounded error Monte Carlo algorithms. Two sided unbounded error Monte Carlo algorithms. Classes of randomized algorithms with polynomial time complexity and relationships between them. Optimisation problem, approximation algorithm, relative error, approximation ratio. Special optimisation problems and approximation solutions. Classification of optimisation problems based upon their approximations. FPTAS. PTAS. TSP problem and its relaxations. Unapproximability.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 115

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 27.83 | 15.65 | 18.26 | 13.91 | 23.48 | 0.87 |

**Provides:** prof. RNDr. Viliam Geffert, DrSc., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ ARP1/15 | **Course name:** Computer architecture |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
Oral examination, written tests.

**Learning outcomes:**
To provide the students with a knowledge of basic principles of computer architecture.

**Brief outline of the course:**
Milestones in computer organization, fundamental limitations. The representation of numbers and the implementation of floating point arithmetic. Combinatorial and sequential circuits, memory organization, RAMs and ROMs. Digital logic level architecture, data path timing, machine cycle. The microarchitecture level, microinstructions and microinstrucion control. The instruction set architecture level, data types, addressing modes, instruction types. Instruction execution, pipelining, cache memory. I/O controllers, ports, interrupts, direct memory access. Device drivers, operating system kernel, device-independent software.

**Recommended literature:**
1. A. S. Tanenbaum: Structured Computer Organization, Prentice Hall, 2005
2. D.A. Patterson, J.L. Hennessy: Computer Organization and Design - The Hardware/Software Interface, Morgan Kaufmann, 2011
3. W. Stallings: Computer Organization and Architecture, Prentice Hall, 2012
4. J. Horák: Hardware, učebnice pro pokročilé, Computer Press, 2007

**Course language:**

**Course assessment**
Total number of assessed students: 58

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 17.24 | 18.97 | 17.24 | 20.69 | 18.97 | 6.9 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ BSIM1/14 | **Course name:** Biomolecular Simulations |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 4.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Elaboration and presentation of the project on given actual subject. Development of own computer programs on project given at the exercises. Exam.

**Learning outcomes:**
Introduction to actual problematics of biomolecular simulations.

**Brief outline of the course:**
Structural characteristics of biological polymers. Foldamers. Central dogma of molecular biology as flow of biological information. 3D-structure and function of foldamers. Recent view on enzyme mechanisms. Experimental methods of structure determination and their limitations. Empirical force fields and methods of classical molecular dynamics. Molecular dynamics and Monte Carlo methods - algorithms and paralelization. Ab initio molecular dynamics and hybrid approaches. Computational challenges in biomolecular simulations - simulations of chemical reactions, free energy evaluation, protein folding. Computational complexity, nontraditional approaches and heuristic approaches.

**Recommended literature:**
Actual literature recommended by lecturer.

**Course language:**

**Course assessment**
Total number of assessed students: 39

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 74.36 | 10.26 | 12.82 | 0.0 | 2.56 | 0.0 |

**Provides:** doc. RNDr. Jozef Uličný, CSc.

**Date of last modification:** 24.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** KFaDF/ DF2p/03 | **Course name:** History of Philosophy 2 (General Introduction) |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:**

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 734

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 60.63 | 13.9 | 12.67 | 8.72 | 3.41 | 0.68 |

**Provides:** doc. PhDr. Pavol Tholt, PhD., mim. prof., Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., doc. Mgr. Róbert Stojka, PhD.

**Date of last modification:** 24.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/DPO/15 | **Course name:** Diploma Thesis and its Defence |
|---|---|

**Course type, scope and the method:**
**Course type:**
**Recommended course-load (hours):**
**Per week: Per study period:**
**Course method:** present

**Number of credits:** 20

**Recommended semester/trimester of the course:**

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 22

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 50.0 | 22.73 | 22.73 | 4.55 | 0.0 | 0.0 |

**Provides:**

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSA1a/15 | **Course name:** Seminar on applied informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of applied informatics in the seminar form. To follow current state in the area using conference proceedings and specialized journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses related to information system development, application of combinatorial algorithms etc.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 20

| abs | n |
|---|---|
| 95.0 | 5.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSA1b/15 | **Course name:** Seminar on applied informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of applied informatics in the seminar form. To follow current state in the area using conference proceedings and specialized journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses related to information system development, application of combinatorial algorithms etc.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 17

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:**

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSB1a/15 | **Course name:** Seminar on security of computer networks |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: the security of computer networks.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 9

| abs | n |
|---|---|
| 88.89 | 11.11 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSB1b/15 | **Course name:** Seminar on security of computer networks |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
In the seminar form to study new knowledges in the area of cryptology and security of computer networks. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: the security of computer networks.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 11

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSL1a/15 | **Course name:** Seminar on logic of information systems |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of logic of information and knowledge systems in the seminar form. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: logic of information systems.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 6

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** RNDr. Peter Gurský, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/DSL1b/15 | **Course name:** Seminar on logic of information systems |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:** ÚINF/DSL1a/15

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of logic of information and knowledge systems in the seminar form. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: logic of information systems.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 13

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** RNDr. Peter Gurský, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSN1a/15 | **Course name:** Seminar on neural networks and stringology |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of neural networks and stringology in the seminar form. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: neural networks and stringology.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 7

| abs | n |
|---|---|
| 85.71 | 14.29 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DSN1b/15 | **Course name:** Seminar on neural networks and stringology |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of neural networks and stringology in the seminar form. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: neural networks and stringology.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 3

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DST1a/15 | **Course name:** Seminar in theoretical informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of the theoretical informatics in the seminar form. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: theoretical foundations of informatics.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 6

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** prof. RNDr. Viliam Geffert, DrSc.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DST1b/15 | **Course name:** Seminar in theoretical informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:** ÚINF/DST1a/15

**Conditions for course completion:**

**Learning outcomes:**
To study new knowledges in the area of the theoretical informatics in the seminar form. To follow current state in the area using conference proceedings and special journals.

**Brief outline of the course:**
Seminar is oriented to an individual work with students which have the diploma theses in the area: theoretical foundations of informatics.

**Recommended literature:**
Special and research literature connected to Diplomaa theses according to recommendations of supervisor.
Katuščák, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.

**Course language:**

**Course assessment**
Total number of assessed students: 2

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** prof. RNDr. Viliam Geffert, DrSc.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/DWA1/15 | **Course name:** Developing web applications with JavaScript |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Principles of JavaScript. Architecture of modern web applications, client-server communications with asynchronous IO programming using NodeJS and MongoDB. Securing web applications. Templates for web page generation. Fundamentals of e-commerce web sites (storefront components, site administration, integrations with third-party services)

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 13

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.08 | 15.38 | 30.77 | 7.69 | 23.08 | 0.0 |

**Provides:**

**Date of last modification:** 23.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ EIL/04 | **Course name:** Information and knowledge systems |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 0 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |

**Course assessment**

Total number of assessed students: 31

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 29.03 | 16.13 | 16.13 | 16.13 | 16.13 | 6.45 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 02.07.2018 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/FAN/15 | **Course name:** Forensic analysis |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** I., II.

**Prerequisities:** ÚINF/BPD1/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 10

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 10.0 | 30.0 | 40.0 | 20.0 | 0.0 | 0.0 |

**Provides:** PhDr. Štefan Franko, PhD., RNDr. JUDr. Pavol Sokol, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/FO1/15 | **Course name:** Formal languages and automata |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To provide theoretical background for studying computer science in general, by giving the necessary knowledge in theory of automata.

**Brief outline of the course:**
Greibach normal structure of contextfree gramars.Deterministic pushdown automata. Context-sensitive grammars and linearly-bounded Turing machines. Deterministic linearly-bounded Turing machines. Space bounded machines. Phrase-structure grammars and Turing machines. Post correspondence problem. Undecidable problems in the theory of formal languages.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 10

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30.0 | 40.0 | 20.0 | 10.0 | 0.0 | 0.0 |

**Provides:** prof. RNDr. Viliam Geffert, DrSc., Mgr. Alexander Szabari, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** KFaDF/IH2/03 | **Course name:** Idea Humanitas 2 (General Introduction) |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 8

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 87.5 | 12.5 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** Doc. PhDr. Peter Nezník, CSc.

**Date of last modification:** 24.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** KFaDF/ KDF/05 | **Course name:** Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction) |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 10

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 50.0 | 20.0 | 10.0 | 0.0 | 10.0 | 10.0 |

**Provides:** doc. PhDr. Pavol Tholt, PhD., mim. prof.

**Date of last modification:** 24.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** KPPaPZ/KK/07 | **Course name:** Communication and Cooperation |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 281

| abs | n | z |
|---|---|---|
| 98.22 | 1.78 | 0.0 |

**Provides:** Mgr. Ondrej Kalina, PhD., Mgr. Lucia Hricová, PhD.

**Date of last modification:** 16.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ KKV1/15 | **Course name:** Classical and quantum computations |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 3 / 1 **Per study period:** 42 / 14
**Course method:** present

**Number of credits:** 6

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Written work
Writen and oral examination

**Learning outcomes:**
To provide information on quantum computer and quantum computations. To compare classical and quantum models and methods.

**Brief outline of the course:**
The basics of classical theory of computation: Turing machines, Boolean circuits, parallel algorithms, probabilistic computation, NP-complete problems, and the idea of complexity of an algorithm. Introduction of general quantum formalism (pure states, density matrices, and superoperators), universal gate sets and approximation theorems. Grover's algorithm, Shor's factoring algorithm, and the Abelian hidden subgroup problem. Parallel quantum computation, a quantum analogue of NP-completeness, and quantum error-correcting codes.

**Recommended literature:**
1. BERMAN,G.P., DOOLEN,G.D., MAINIERI, R., TSIFRINOVIC, V.I. Introduction to Quantum Computers. World Scientific, 2003.
2. GRUSKA, J. Quantum Computing. McGraw-Hill, 1999.
3. JOHNSON, G. A Shortcut Through Time: The Path to the Quantum Computer, Knopf 2003.
4. KITAEV, A.Y., SHEN, A.H., VYALYI, M.N. Classical and Quantum Computation. American Mathematical Society, 2002.
5. NIELSEN, M.A., CHUANG, I.L. Quantum Computation and Quantum Information. Cambridge University Press, 2000.
6. HIRVENSALO, M., Quantum Computing, Springer 2004

**Course language:**

**Course assessment**
Total number of assessed students: 104

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.08 | 35.58 | 14.42 | 14.42 | 8.65 | 3.85 |

| |
|---|
| **Provides:** doc. RNDr. Gabriel Semanišin, PhD., RNDr. Zuzana Bednárová, PhD. |
| **Date of last modification:** 07.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ KMU1/15 | **Course name:** Coding and multimedial data transition |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 14

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 35.71 | 0.0 | 21.43 | 28.57 | 14.29 | 0.0 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD., doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/ KOA/10 | **Course name:** Combinatorial algorithms |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 3 / 1 **Per study period:** 42 / 14
**Course method:** present

**Number of credits:** 6

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Oral examination

**Learning outcomes:**
Mastered an ability to understand the close tie between the theoretical and algorithmic aspects of discrete mathematics and to show how algorithms can be extacted from theorems. Ability in proving algorithm correctness.

**Brief outline of the course:**
Introduction to graphs.
Introduction to algorithms and complexity. Sorting algorithms. Search algorithms. Greedy algorithms. NP-completeness.
Trees and rooted trees. Generating all spanning trees of a graph. Minimum spanning tree problem. Distance in graphs. Shortest path problem and its analogues. The most reliable path. The largest capacity path. The path with the largest expected capacity.
Location centres and medians.
Networks: An introduction to networks, the max-flow min-cut theorem. Related problems.
Matchings: Maximum matchings in bipartite graphs. Maximum matchings in general graphs. Transportation and assignment problems.
Eulerian graphs and Chinese postman's problem.
Hamiltonian graphs. Travelling salesman problem.

**Recommended literature:**
1. G. Chartrand, O.R. Vellermann: Applied and Algorithmic Graph Theory, McGraw-Hill, Inc. New York 1993.
2. N. Christofides: Graph Theory - An Algorithmic Approach, Academic Press, New York 1975 (Russian translation from 1978).
3. D. Jungnickel: Graphs, Networks, and Algorithms, Springer-Verlag Berlin 2005.
4. J. Plesník: Grafové algoritmy, Veda Bratislava 1983.
5. M. N. S. Swamy, K. Thulasiraman: Graphs, networks, and algorithms. John Wiley and Sons, New York 1981.

**Course language:**
Slovak

**Course assessment**
Total number of assessed students: 102

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 37.25 | 21.57 | 20.59 | 8.82 | 10.78 | 0.98 |

**Provides:** Dr.h.c. prof. RNDr. Stanislav Jendrol', DrSc.

**Date of last modification:** 22.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚTVŠ/ KP/12 | **Course name:** Survival Course |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 36s<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I., II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 329 | |

| abs | n |
|---|---|
| 47.11 | 52.89 |

| |
|---|
| **Provides:** MUDr. Peter Dombrovský, Mgr. Marek Valanský |
| **Date of last modification:** 23.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ KRP1/15 | **Course name:** Cryptographic protocols |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
written test

**Learning outcomes:**
to acquire knowledge on design and verifying of cryptographic protocols

**Brief outline of the course:**
Authentication and key establishment using shared and public key cryptography,
key agreement protocols, conference key agreement, zero-knowledge protocols.

**Recommended literature:**
1. Colin Boyd, Anish Mathuria: Protocols for Authentication and Key Establishment, Springer, 2003
2. Douglas R. Stinson: Cryptography: Theory and Practice, Third Edition, Chapman & Hall/CRC, 2006
3. Bruce Schneier: Applied Cryptography, Second Edition,
John Wiley & Sons Inc., 1996
4. Peter Ryan, Steve Schneider: Modeling and Analysis of Security Protocols, Addison-Wesley, 2001

**Course language:**

**Course assessment**
Total number of assessed students: 6

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 16.67 | 0.0 | 16.67 | 33.33 | 16.67 | 16.67 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD., doc. RNDr. Jozef Jirásek, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ KRS/15 | **Course name:** Cryptographic systems and their applications |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 3 / 2 **Per study period:** 42 / 28
**Course method:** present

**Number of credits:** 6

**Recommended semester/trimester of the course:** 1.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 103

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 13.59 | 8.74 | 10.68 | 12.62 | 34.95 | 19.42 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ LAD1/15 | **Course name:** Logical aspects of databases |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To understand and to be able to formalize relationships between databases, first order logic and logic programming.

**Brief outline of the course:**
Relationships between databases, logic and logic programming.

**Recommended literature:**
Serge Abiteboul, Richard Hull, Victor Vianu: Foundations of Databases. Addison-Wesley 1995, ISBN 0-201-53771-0

**Course language:**

**Course assessment**
Total number of assessed students: 76

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 39.47 | 15.79 | 19.74 | 13.16 | 9.21 | 2.63 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚTVŠ/ LKSp/13 | **Course name:** Summer Course-Rafting of TISA River |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 36s<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I., II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 126 | |

| abs | n |
|---|---|
| 45.24 | 54.76 |

| |
|---|
| **Provides:** Mgr. Peter Bakalár, PhD. |
| **Date of last modification:** 23.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/ MAN3a/10 | **Course name:** Mathematical analysis I for informaticians and physicists |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 4 / 3 **Per study period:** 56 / 42
**Course method:** present

**Number of credits:** 8

**Recommended semester/trimester of the course:** 1.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
Continuous assessment is taken the form of small tests and two main tests during the semester. Final evaluation is given by continuous assessment (50%), written and oral part of the exam (50%).

**Learning outcomes:**
The course provides students with the basics of mathematical analysis necessary to study physics and computer science. The students also learn mathematical culture, notation and mathematical way of thinking and expression.

**Brief outline of the course:**
1. Introduction - language of mathematics, basics of formal logic.
2. Real numbers and sets - ordering, boundedness, infimum, supremum.
3. Sequences - boundedness, monotonicity, convergence, subsequences.
4. Series - sum, tests for convergence, absolute and relative convergence.
5. Functions of one real variable - fundamental concepts, limits and operations with them.
6. Continuous functions and their properties on the set (interval). Elementary functions.
7. Derivative, differentiability, difference and differential, fundamental theorems of differential calculus.
8. Using differential calculus for the investigation of properties of functions and their behavior.
9. Other applications of derivative - calculation of limits, Taylor polynomials.
10. Power series - radius and range of convergence, properties of the sum of power series, Taylor series.

**Recommended literature:**
1. B. Mihalíková, J. Ohriska: Matematická analýza 1, vysokoškolský učebný text, UPJŠ v Košiciach, Košice, 2000 (in Slovak).
2. Z. Došlá, J. Kuben: Diferenciální počet funkcí jedné proměnné, vysokoškolský učebný text, Masarykova univerzita v Brne, Brno, 2004 (in Czech).
3. D. Brannan: A First Course in Mathematical Analysis, Cambridge University Press, Cambridge, 2006.
4. K. A. Ross: Elementary Analysis: The theory of Calculus, Springer, New York, 2010.
5. A. Banner: The calculus lifesaver, Princeton university press, Princeton, 2007.

6. B. S. Thomson, J. B. Bruckner, A. M. Bruckner: Elementary real analysis, Prentice Hall (Pearson), Lexington, 2008.
7. J. Stewart: Calculus: Early Transcendentals, Brooks Cole (Thomson), Toronto, 2008.

**Course language:**
slovak

**Course assessment**
Total number of assessed students: 922

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 6.94 | 8.03 | 13.02 | 15.73 | 36.98 | 19.31 |

**Provides:** RNDr. Jaroslav Šupina, PhD., RNDr. Lenka Halčinová, PhD.

**Date of last modification:** 22.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/ MAN3b/10 | **Course name:** Mathematical analysis II for informaticians and physicists |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 4 / 3 **Per study period:** 56 / 42
**Course method:** present

**Number of credits:** 8

**Recommended semester/trimester of the course:** 2.

**Course level:** I., II.

**Prerequisities:** ÚMV/MAN3a/10

**Conditions for course completion:**
Continuous assessment is taken the form of small tests and two main tests during the semester. Final evaluation is given by continuous assessment (50%), written and oral part of the exam (50%).

**Learning outcomes:**
The course provides students with the basics of mathematical analysis necessary to study physics and computer science. The students also learn mathematical culture, notation and mathematical way of thinking and expression.

**Brief outline of the course:**
1. Integral calculus of functions of one real variable: a) Indefinite integral - primitive function and its properties, techniques of integration; b) Definite Riemann integral - definition, elementary properties, calculation methods, classes of integrable functions, applications; c) Improper integral.
2. Ordinary differential equations - basic concepts, the first order equations (separable, homogeneous, linear, Bernoulli), linear equations of the second order (also with constant coefficients).
3. Metric space - Euclidean space, some topological properties of points and sets.
4. Function of several real variables - basic concepts, limits and continuity.
5. Differential calculus of functions of several real variables - partial derivative, differentiability and total differential (also higher order), Taylor polynomials, directional derivative, local and global extrema, constrained local extrema.
6. Double (two dimensional) integral - definition, calculation methods, applications.

**Recommended literature:**
1. L. Kluvánek, I. Mišík, M. Švec: Matematika I, II, SVTL, Bratislava, 1959 (in Slovak).
2. Z. Došlá, O. Došlý: Diferenciální počet funkcí více proměnných, vysokoškolský učebný text, Masarykova univerzita v Brne, Brno, 2003 (in Czech).
3. J. Eliaš, J. Horváth, J. Kajan: Zbierka úloh z vyššej matematiky 2, 3, 4, Alfa, Bratislava, 1971 (in Slovak).
4. J. C. Robinson: An introduction to ordinary differential equations, Cambridge University Press, Cambridge, 2004.
5. R. E. Williamson, H. F. Trotter: Multivariable mathematics, Prentice Hall (Pearson), Upper Saddle River, 2004.

6. B. S. Thomson, J. B. Bruckner, A. M. Bruckner: Elementary Real Analysis, Prentice Hall (Pearson), Lexington, 2008.
7. J. Stewart: Calculus: Early Transcendentals, Brooks Cole (Thomson), Toronto, 2008.

**Course language:**
Slovak

**Course assessment**
Total number of assessed students: 441

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 7.71 | 8.16 | 11.56 | 18.82 | 39.46 | 14.29 |

**Provides:** RNDr. Jaroslav Šupina, PhD., RNDr. Lenka Halčinová, PhD.

**Date of last modification:** 22.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ MIN1/15 | **Course name:** Informatics for medicine |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
Oral and written exam

**Learning outcomes:**
To present an application of computer science in medicine domain with emphasis on the specific conditions for so-called safety-relevant domain.

**Brief outline of the course:**
Software development go medicine domain (radiotherapy and ultrasound). Syngo platform, MS .NET, C#, C++. Development based on so-called "V" development model. An overview of used software tools:
RationalRose, RequisitePro, UITA, Caliber, ClearCase. Quality and process management and SW company mangement according to CMMI methodology.

**Recommended literature:**
http://www.syngo.com
http://www.siemens.com

**Course language:**

**Course assessment**
Total number of assessed students: 74

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 74.32 | 25.68 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/MIN2/15 | **Course name:** Informatics for medicine |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 4.

**Course level:** I., II.

**Prerequisities:** ÚINF/MIN1/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 3

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 33.33 | 0.0 | 33.33 | 0.0 | 33.33 | 0.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ MPJ1/15 | **Course name:** Modern programming languages |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 2 **Per study period:** 14 / 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
Mastering the basics of standard and experimental programming models and techniques.

**Brief outline of the course:**
Object oriented programming, Generic programming – parametric polymorphism. Vector programming – operator overloading, indexer. Event programming (event handling) – delegates. Attribute programming. Parallel and multithread programming – processes, threadpool. Functional and declarative programming – lambda expressions, LINQ. Graphics primitives.

**Recommended literature:**
1. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Platform, 2012, APRESS
2. Joseph Albahari, Ben Albahari, C# 5.0 in a Nutshell: The Definitive Reference, 2012, O'REILLY
3. Daniel Solis, Illustrated C# 2012, 2012, APRESS

**Course language:**

**Course assessment**
Total number of assessed students: 118

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 16.1 | 18.64 | 24.58 | 22.88 | 17.8 | 0.0 |

**Provides:** doc. RNDr. Csaba Török, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/MSSI/15 | **Course name:** Informatika II. |
|---|---|

**Course type, scope and the method:**
**Course type:**
**Recommended course-load (hours):**
**Per week: Per study period:**
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:**

**Course level:** II.

**Prerequisities:** ((ÚINF/KRP1/15 or ÚINF/ARP1/15) and ÚINF/OPS1/15) or (ÚINF/LAD1/15 and ÚINF/AIS1/15) or ((ÚINF/VYU1/15 or ÚINF/STU1/16) and (ÚINF/NEU1/15 or ÚINF/VKN/15)) or (ÚINF/KKV1/15 and ÚMV/KOA/10)

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 22

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 59.09 | 4.55 | 22.73 | 9.09 | 4.55 | 0.0 |

**Provides:**

**Date of last modification:** 01.03.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ NEU1/15 | **Course name:** Neural networks |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To understand and to know using basic paradigms of neural networks.

**Brief outline of the course:**
Feed-forward and recurrent neural networks, back propagation algorithm to adaptation of neural networks, a capability of neural networks to be an universal approximator. Hopfield neural networks and solving optimization problems. Kohonen neural networks. Neural networks in connections to computational models. Theoretical problems of neural networks.

**Recommended literature:**
J. Hertz, A.Krogh, R.G. Palmer: Introduction to the theory of neural computation, Addison Wesley, 1991.
V. Kvasnička a kol.: Úvod do teórie neurónových sietí, IRIS, Bratislava, 1997.
J. Šíma, R. Neruda: Teoretické otázky neurónových sítí. Matfyzpress,MFF UK, Praha, 1996.

**Course language:**

**Course assessment**
Total number of assessed students: 199

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14.07 | 13.57 | 24.12 | 23.12 | 20.1 | 5.03 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc., RNDr. Ľubomír Antoni, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ NOT1a/03 | **Course name:** Nontraditional Optimization Techniques I |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
Monitoring progress in solving applied projects.
examination (50%), quality of the project (50%)
examination

**Learning outcomes:**
To familiarize students with biologically and physically inspired optimization, simulation and prediction techniques. To expand students' creativity and programming skills by applying heuristic techniques in solving applied problems.

**Brief outline of the course:**
Fundamentals of optimization theory. Basic optimization problems. Basic types of objective functions. Classification of optimization techniques. Gradient-based optimization techniques. Evolutionary algorithms. Genetic algorithms. Genetic algorithms as Markov processes. Statistical Mechanics Approximations of Genetic Algorithms. Monte Carlo simulation and simulated annealing. Swarm optimization. Cellular Automata and their applications in simulations of complex systems. Fractals. Agent-based models. Evolutionary games. Evolution of cooperation. Fundamentals of Neural Networks. Application of singular value decomposition to solve least squares problems.

**Recommended literature:**
Hartmann, A. K., Rieger, H., Optimization Algorithms in Physics, Wiley, 2002
Reeves, C. R., Rowe, J. E., Genetic Algorithms: Principles and perspectives, Kluwer, 2003
Mitchell, M., Complexity. A Guided Tour, Oxford University Press, 2009
Solé, R. V., Phase Transitions, Princeton University Press, 2011
Ilachinski, A., Cellular Automata. A Discrete universe, World Scientific, 2002
Haykin, S., Neural Networks. A Comprehensive Foundation, Prentice-Hall, 1999

**Course language:**

**Course assessment**
Total number of assessed students: 66

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 66.67 | 18.18 | 7.58 | 3.03 | 4.55 | 0.0 |

| |
|---|
| **Provides:** RNDr. Branislav Brutovský, CSc. |
| **Date of last modification:** 24.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ NOT1b/03 | **Course name:** Nontraditional Optimization Techniques II |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 4.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
Presentation of the project in written form. Oral exam and discussion of the presented project.

**Learning outcomes:**
By using examples from the biology to learn applications of optimization techniques on study and interpretation of complex systems. Introduction to new paradigms in the area of systems biology.

**Brief outline of the course:**
Complex systems, emergent behavior. Evolutionary theory and memetics. Application of optimization techniques on complex systems. Application of methods /genetic algorithms, simulated annealing, taboo search/ on selected problems of biomolecular simulations. Molecular dynamics, protein folding. Population dynamics, metabolic networks and complexity in bioinformatics.

**Recommended literature:**
The actual scientific papers.

**Course language:**

**Course assessment**
Total number of assessed students: 39

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 87.18 | 5.13 | 5.13 | 2.56 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Jozef Uličný, CSc.

**Date of last modification:** 24.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/NSQL/17 | **Course name:** NoSQL databázy |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Active attendance at seminars, participation on common project.

**Learning outcomes:**
Know properties of different kinds of NoSQL databases, have an practical experience with given NoSQL databases, gain skills to identify the appropriate kind of NoSQL database for given purpose.

**Brief outline of the course:**
1. Big data, types of NoSQL databases.
2. Data representation formats
3. Key-value databases.
4. Document-oriented databases.
5. Column-oriented databases.
6. Graph databases.
7. Transactions in distributed environment.
8. Comparing the performance of databases for different kinds of data and queries.

**Recommended literature:**
1.HARRISON G.: Next Generation Databases: NoSQL, NewSQL, and Big Data. Apress, 2015. ISBN 978-1-4842-1330-8.
2. HILLS T.: NoSQL and SQL Data Modeling: Bringing Together Data, Semantics, and Software. Technics Publications, 2016. ISBN 978-1-6346-2109-0

**Course language:**
Slovak or English

**Course assessment**
Total number of assessed students: 13

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 38.46 | 30.77 | 15.38 | 7.69 | 7.69 | 0.0 |

**Provides:** RNDr. Peter Gurský, PhD.

**Date of last modification:** 23.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ OPS1/15 | **Course name:** Security of computer networks |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 8

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 50.0 | 0.0 | 0.0 | 37.5 | 12.5 | 0.0 |

**Provides:** RNDr. Rastislav Krivoš-Belluš, PhD., doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/OPSP/14 | **Course name:** ABAP and Object and Dialogue Programming |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 3 / 1 **Per study period:** 42 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** II.

**Prerequisities:** ÚINF/RASP/14 or ÚINF/RASP/16

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Screen, function codes, local and global classes, inheritance, polymorphism.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 27

| abs | n |
|---|---|
| 62.96 | 37.04 |

**Provides:** RNDr. Štefan Pero

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PAZ1a/15 | **Course name:** Programming, algorithms, and complexity |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 3 / 4 **Per study period:** 42 / 56
**Course method:** present

**Number of credits:** 8

**Recommended semester/trimester of the course:** 1.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**
Get a prescribed minimum number of points for activities of continuous assessment and for solving tasks during final practical test.

**Learning outcomes:**

**Brief outline of the course:**
First part of the course (with turtle graphics): New Eclipse project, interactive communication with objects, simple turtle graphics, making user methods, local variables, variable types, arithmetic and logical expressions, random numbers, conditions, loops for and while, debugging, references, chars, Strings, arrays, instance variables, mouse events, simple array algorithms.
Second part of the course (without turtle graphics): Exceptions, using try-catch-finally block, files and directories, conversion from string variables, encapsulation, constructors with parameters, constructors hierarchy, getters and setters, interfaces, inheritance and polymorphism, abstract classes and methods, packages, visibility modifiers, sorting using Arrays.sort() and interfaces Comparable and Comparator, Java Collections Framework: autoboxing, interface List, ArrayList, LinkedList, interface Set and class HashSet, methods equals() and hashCode(), for-each loop, interface Map and class HashMap, custom Exceptions, rethrowing exceptions, exceptions' inheritance, Runtime exceptions, Errors, static variables and methods.

**Recommended literature:**
1. ECKEL, B.: Thinking in Java, Pearson, 2006, ISBN: 978-01-318-7248-6
2. PECINOVSKÝ, R.: OOP - Naučte se myslet a programovat objektově, Computer Press, a.s., Brno, 2010, ISBN: 978-80-251-2126-9
3. SIERRA, K., BATES, B. Head First Java, O'Reilly Media; 2nd edition, 2005, ISBN: 978-05-960-0920-5

**Course language:**
Slovak language, english language is required only to read Java API documentation.

**Course assessment**
Total number of assessed students: 560

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 18.04 | 7.5 | 11.43 | 15.54 | 13.39 | 34.11 |

| |
|---|
| **Provides:** RNDr. František Galčík, PhD., RNDr. Zuzana Bednárová, PhD., RNDr. Juraj Šebej, PhD. |
| **Date of last modification:** 06.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PAZ1b/15 | **Course name:** Programming, algorithms, and complexity |

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 4 **Per study period:** 28 / 56
**Course method:** present

**Number of credits:** 7

**Recommended semester/trimester of the course:** 2.

**Course level:** I., II.

**Prerequisities:** ÚINF/PAZ1a/15

**Conditions for course completion:**
Get a given minimum number of points for activities of continuous assessment and for solving tasks during final practical test. The final practical test focuses on application of known algorithms and techniques of efficient algorithm design.

**Learning outcomes:**

**Brief outline of the course:**
Recursion and its applications, fractals. Binary search and simple sorting algorithm with quadratic time complexity. Time and space complexity of algorithms, analysis of time complexity, O-notation. Basic data structures and their applications: linked list, stack, and queue. Hierarchical data and their representation, trees, tree traversals, binary search trees. Arithmetic expressions, evaluation of an arithmetic expression. Efficient sorting algorithm: QuickSort, MergeSort, and HeapSort. Backtrack. Techniques "divide and conquer" and dynamic programming as methods for design of efficient algorithms. Basic graph algorithms for unweighted graphs (Breadth-first search, Depth-first search, graph connectivity, graph components, graph bridges, topological sort) and for weighted graphs (shortest paths: Bellman-Ford algorithm, Dijkstra algorithm, Floyd-Warshallov algorithm; minimum spanning tree: Prim algorithm, Kruskal algorithm). String algorithms. Greedy algorithms.

**Recommended literature:**
WRÓBLEWSKI, P.: Algoritmy, datové struktury a programovací techniky. Computer Press, Brno, 2004
CORMEN, T.H., LEISERSON, Ch.E., RIVEST, R.L, STEIN, C. Introduction to Algorithms. The MIT Press, 2009.
KLEINBERG, J., TARDOS, E.: Algorithm Design, Cornell University, Addison Wesley, New York, 2006.

**Course language:**
Slovak language, literature is available in english and czech language.

**Course assessment**
Total number of assessed students: 1105

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 12.31 | 6.61 | 9.41 | 20.27 | 22.99 | 28.42 |
| **Provides:** RNDr. František Galčík, PhD., PaedDr. Ján Guniš, PhD., RNDr. Zuzana Bednárová, PhD. | | | | | |
| **Date of last modification:** 06.02.2017 | | | | | |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. | | | | | |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PDB1/15 | **Course name:** Organization and data processing |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
final exam

**Learning outcomes:**
To understand the principles of database management systems. To be able to use the knowledge when solving optimization problems over big data and managing parallel and distributed databases.

**Brief outline of the course:**
Data representation, disk and file organization, tree-based indexing methods B+tree, R-tree, Hash-based indexing methods, external sorting, enumeration of relational operators, query optimization, transaction management, parallel and distributed databases, database security, recovery management, profiling, data reduction

**Recommended literature:**
1. R. RAMAKRISHNAN, J. GEHRKE: Database Management Systems, McGraw Hill Higher Education, 2003
2. A. SILBERSCHATZ, H. F. KORTH, S. SUDARSHAN: Database system concepts, McGraw Hill Higher Education, 2006

**Course language:**

**Course assessment**
Total number of assessed students: 73

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 26.03 | 20.55 | 16.44 | 12.33 | 24.66 | 0.0 |

**Provides:** doc. RNDr. Csaba Török, CSc., RNDr. Peter Gurský, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PDS1/15 | **Course name:** Parallel and distributed systems |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
to introduce the fundamentals of parallel and distributed programming

**Brief outline of the course:**
current parallel and distributed architectures, basic issues in parallel and distributed applications development, data structures and programming methodologies

**Recommended literature:**
1. Kenneth A. Berman and Jerome L. Paul: Algorithms: Sequential, Parallel, and Distributed, Thomson, 2005, ISBN 0-534-42057-5
2. Gregory R. Andrews: Foundations of Multithreaded, Parallel, and Distributed Programming, Addison-Wesley, 2000, ISBN 0-201-35752-6
3. Joseph JáJá: An Introduction to Parallel Algorithms, Addison-Wesley, 1992, ISBN 0-201-54856-9
4. Gerard Tel: Introduction to Distributed Algorithms, Cambridge University Press, 1994, ISBN 0-521-47069-2

**Course language:**

**Course assessment**
Total number of assessed students: 133

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.31 | 16.54 | 15.04 | 18.05 | 15.79 | 11.28 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PDSI1/15 | **Course name:** Pro-seminar to diploma thesis in informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 1.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To inform students about areas of informatics they are suitable to work in diploma theses. In the end of semester students have to prepared themes of diploma theses, goals and recommended study literature.

**Brief outline of the course:**
The seminar is oriented to problems prospective to preparations of Diploma theses.

**Recommended literature:**
MEŠKO, D., KATUŠČÁK, D. Akademická príručka. 1. vyd. Vydavateľstvo Osveta : Martin, 2004. 316 s. ISBN 80-8063-150-6
ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents.
Eco, U.: Jak napsat diplomovou práci, z taliančiny Come si fa una tesi di laures, Milano, 1977, Olomouc, Votobiax.
Odborná a vedecká literatúra týkajúca sa diplomovej práce podľa odporúčania vedúceho diplomovej práce.

**Course language:**

**Course assessment**
Total number of assessed students: 427

| abs | n |
|---|---|
| 99.3 | 0.7 |

**Provides:** doc. RNDr. Ľubomír Šnajder, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PPU1a/15 | **Course name:** Running practice |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** 2. | |
| **Course level:** II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 154 | |
| abs | n |
| 97.4 | 2.6 |
| **Provides:** RNDr. JUDr. Pavol Sokol, PhD. | |
| **Date of last modification:** 07.02.2017 | |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. | |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PPU1b/15 | **Course name:** Running practice |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 3 **Per study period:** 42<br>**Course method:** present | |
| **Number of credits:** 3 | |
| **Recommended semester/trimester of the course:** 3. | |
| **Course level:** II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 99 | |
| abs | n |
| 98.99 | 1.01 |
| **Provides:** RNDr. JUDr. Pavol Sokol, PhD. | |
| **Date of last modification:** 07.02.2017 | |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. | |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** Dek. PF UPJŠ/PPZ/13 | **Course name:** Personality Development and Key Competences for Success on a Labour Market |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week: Per study period:** 14s
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 39

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** RNDr. Peter Stefányi, PhD.

**Date of last modification:** 13.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** KPPaPZ/PPZMg/12 | **Course name:** Psychology and Health Psychology (Master´s Study) |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 2 **Per study period:** 14 / 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:**

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 226

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 19.47 | 25.22 | 25.66 | 13.27 | 15.93 | 0.44 |

**Provides:** PhDr. Anna Janovská, PhD., Mgr. Lucia Hricová, PhD.

**Date of last modification:** 16.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRJm1a/15 | **Course name:** Software project |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 4 **Per study period:** 56
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To learn a methods in a preparation of some bigger software in all phases of its life cycle (analysis, specifications, solution, implementation, testing).

**Brief outline of the course:**
The students are expected to work on their own on a project specified by the project supervisor. They report regularly on their progress. Before recognition they report on their progress in public defense session before an examination board.
This semester is mainly devoted to a detailed analysis of user requirements and corresponding system specification.
Project themes will be published at the Computer Science Department prior to the students final enrolment for the following year. The projects will be divided into five areas according to their subjects (neural networks, computer network security, mathematical models, logic of information systems and computer graphics). The student shall enrol in one of the seminars dealing with the above subjects in accordance with the subject of his/her project.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 23

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 73.91 | 0.0 | 4.35 | 4.35 | 13.04 | 4.35 |

**Provides:** Mgr. Alexander Szabari, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRJm1b/15 | **Course name:** Sofware project |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 4 **Per study period:** 56
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To learn a methods in a preparation of some bigger software in all phases of its life cycle (analysis, specifications, solution, implementation, testing).

**Brief outline of the course:**
The work in the seminar continues on the project by a realisation of the developed solution, a work on a documetation of the project and a public presentation of the results.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 9

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 77.78 | 11.11 | 11.11 | 0.0 | 0.0 | 0.0 |

**Provides:** Mgr. Alexander Szabari, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PSDU/16 | **Course name:** Case studies in data mining |

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 0

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** RNDr. Juraj Šebej, PhD., RNDr. Erik Bruoth, PhD.

**Date of last modification:** 09.03.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SDI1a/15 | **Course name:** Seminar to diploma theses in informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:** ÚINF/PDSI1/15

**Conditions for course completion:**

**Learning outcomes:**
Monitoring and public presentation of work done so fare on thesis preparation

**Brief outline of the course:**
Every thesis has a compulsory theoretical part and may also contain a software part. To gain recognition, the following is necessary: a detailed compilation of studied literature (a minimum of thirty pages) and at least twenty pages of text containing the candidate's own views of the problem area, possible research goals, own results are welcome (if the thesis is purely theoretical, this will be judged more strictly). For the SW part: a tested implementation (must conform to user requirements, help and user friendly user interface not necessary at this stage) and access to source texts.
For both parts there will be an oral presentation and discussion.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 146

| abs | n |
|---|---|
| 93.84 | 6.16 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SDI1b/15 | **Course name:** Seminar to diploma theses in informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:** ÚINF/SDI1a/15

**Conditions for course completion:**

**Learning outcomes:**
Monitoring and public presentation of work done so fare on thesis preparation

**Brief outline of the course:**
Every thesis has a compulsory theoretical part and may also contain a software part. To gain recognition, the following is necessary: a detailed compilation of studied literature (a minimum of thirty pages) and at least twenty pages of text containing the candidate's own views of the problem area, possible research goals, own results are welcome (if the thesis is purely theoretical, this will be judged more strictly). For the SW part: a tested implementation (must conform to user requirements, help and user friendly user interface not necessary at this stage) and access to source texts.
For both parts there will be an oral presentation and discussion.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 129

| abs | n |
|---|---|
| 99.22 | 0.78 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/SDI1c/15 | **Course name:** Seminar to diploma theses in informatics |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 4.

**Course level:** II.

**Prerequisities:** ÚINF/SDI1b/15

**Conditions for course completion:**

**Learning outcomes:**
Monitoring and public presentation of work done so fare on thesis preparation

**Brief outline of the course:**
Every thesis has a compulsory theoretical part and may also contain a software part. To gain recognition, the following is necessary: a detailed compilation of studied literature (a minimum of thirty pages) and at least twenty pages of text containing the candidate's own views of the problem area, possible research goals, own results are welcome (if the thesis is purely theoretical, this will be judged more strictly). For the SW part: a tested implementation (must conform to user requirements, help and user friendly user interface not necessary at this stage) and access to source texts.
For both parts there will be an oral presentation and discussion.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 115

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Jozef Jirásek, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/SGV1/16 | **Course name:** Seminar on computer graphics and vision |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Seminar is connecte to the lecture UGR Introduction to computer graphics. In seminar form students presents actual theoretical and implementation problems. Main goal in interest is oriented to quick algorithms of computer graphics, geometric modelling and realistic drawing of scenes.
Knowledge from the lecture UGR and good programmers experience are supposed.

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 44

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 70.45 | 15.91 | 11.36 | 2.27 | 0.0 | 0.0 |

**Provides:** RNDr. Rastislav Krivoš-Belluš, PhD., doc. RNDr. Jozef Jirásek, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SLO1a/15 | **Course name:** Symbolic logic |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To understand basic notions of sentence and predicate logic - sentence, sentence scheme, provability, satisfiability, term, formula.

**Brief outline of the course:**
Predicate logic – logic language, syntax and semantics, term, formula. Axioms, proof, provability. Interpretation, truth, model. Correctness of the predicate logic.

**Recommended literature:**
GOLDSTERN M., JUDAH H.: The Incompleteness Phenomenon, A New Course in Mathematical Logic, A K Peters, Wellesley, Massachusetts, 1995
http://cs.ics.upjs.sk/~krajci/skola/vyucba/ucebneTexty/logika/logika.pdf

**Course language:**

**Course assessment**
Total number of assessed students: 378

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 21.96 | 10.32 | 12.96 | 12.17 | 28.84 | 13.76 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SLO1b/15 | **Course name:** Symbolic logic |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 3.

**Course level:** I., II.

**Prerequisities:** ÚINF/SLO1a/15

**Conditions for course completion:**

**Learning outcomes:**
To understand basic notions of predicate logic – inductive strutures, completeness.

**Brief outline of the course:**
Boolean algebras. Syntactic model, completeness of predicate logic. Inductive structures in general.

**Recommended literature:**
GOLDSTERN M., JUDAH H.: The Incompleteness Phenomenon, A New Course in Mathematical Logic, A K Peters, Wellesley, Massachusetts, 1995
http://cs.ics.upjs.sk/~krajci/skola/vyucba/ucebneTexty/logika/logika.pdf

**Course language:**

**Course assessment**
Total number of assessed students: 45

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 28.89 | 4.44 | 17.78 | 6.67 | 15.56 | 26.67 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SPS1/15 | **Course name:** Seminar in network programming |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 3 **Per study period:** 42
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To render current technologies of programing in network distributed environment.

**Brief outline of the course:**
Basics of programming the client-server applications, iterative and concurrent servers, Remote Procedure Calls. Server-side programming, CGI, PHP, basics of Perl and Python. Script languages, ASP, JSP, Component Object Model, Corba, database connection's interfaces. Document Object Model, XML, XSL, dynamic extensions of HTML.
Advanced level of programming is expected.

**Recommended literature:**
Internet sources and specifications.

**Course language:**

**Course assessment**
Total number of assessed students: 68

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 63.24 | 19.12 | 14.71 | 1.47 | 1.47 | 0.0 |

**Provides:** RNDr. Rastislav Krivoš-Belluš, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPPaPZ/SPVKE/07 | **Course name:** Social-Psychological Training of Coping with Critical Life Situations |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** 2. | |
| **Course level:** II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 126 | |

| abs | n | z |
|---|---|---|
| 97.62 | 2.38 | 0.0 |

| |
|---|
| **Provides:** Mgr. Ondrej Kalina, PhD. |
| **Date of last modification:** 16.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ STU1/16 | **Course name:** Machine learning |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 18

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22.22 | 22.22 | 33.33 | 5.56 | 16.67 | 0.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc., RNDr. Ľubomír Antoni, PhD.

**Date of last modification:** 09.03.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SVK1/15 | **Course name:** Student scientific conference |
|---|---|

**Course type, scope and the method:**
**Course type:**
**Recommended course-load (hours):**
**Per week: Per study period:**
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 4.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 138

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:**

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SWB/15 | **Course name:** Semantic web |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 3 **Per study period:** 42
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To understand semantic web languages RDF, RDFS, OWL, ability to use them ina practical semantic web applications, experience with ontology modelling and communication with ontology databases.

**Brief outline of the course:**
- Semantic web - motivation, problems, visions.
- XML, syntax, programming models DOM, SAX, StAX, namespaces in XML, XPath, XQuery. Examples in of processing in Java.
- Semantic web modelling languages: RDF, RDFS, OWL
- Semantic web query language SPARQL
- Software tools: Jena, Sesame, Protege, Ontopia
- Introduction to Description logic
- Inferencing in Description logic

**Recommended literature:**
[1]Grigoris Antoniou and Frank van Harmelen: Semantic Web Primer, Second Edition. MIT Press, 2008. ISBN: 978-0-262-01242-3
[2] Franz Baader, Diego Calvanese, Deborah McGuinness, Daniele Nardi, Peter Patel-Schneider: The Description Logic Handbook. Theory, Implementation and Applications
[3] http://www.openrdf.org/
[4] http://protege.stanford.edu/
[5] http://jena.sourceforge.net/
[6] http://www.w3.org/TR/rdf-sparql-query/

**Course language:**

**Course assessment**
Total number of assessed students: 49

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 73.47 | 8.16 | 10.2 | 2.04 | 2.04 | 4.08 |

| |
|---|
| **Provides:** RNDr. Peter Gurský, PhD. |
| **Date of last modification:** 09.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ TDB1/15 | **Course name:** Development of web-oriented database applications |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Work on a project.
Presentation of a project.

**Learning outcomes:**
To learn modern methods for a development of web-oriented applications with emphasis on database server ORACLE and programming techniques in JAVA.

**Brief outline of the course:**
Oracle SQL Data Manipulation Language. Oracle SQL Data Definition Language. Oracle PL/SQL. Java JDBC API Java Database Connectivity. Java JDBC API. Java JSP. JSTL.

**Recommended literature:**
1. http://www.oracle.com

**Course language:**

**Course assessment**
Total number of assessed students: 1

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Csaba Török, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ TIK1/15 | **Course name:** Information theory, encoding |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 56

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 55.36 | 14.29 | 12.5 | 5.36 | 0.0 | 12.5 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ TVY/15 | **Course name:** Computability theory |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To provide theoretical background for studying computer science in general, by familiarising students with basic knowledge of the theory of computability.

**Brief outline of the course:**
Turing machine as a formalisation of the notion of an algorithm. Partial recursive functions. Kleene's normal form theorem. The equivalences of the notion of a function calculable by a Turing machine, partial recursive and calculable by a computer program. Algorithmical undecidability of the halting problem of a Turing machine and a computer program.

**Recommended literature:**
MACHTEY, M. and YOUNG, P.: An Introduction to the General Theory of Algorithms, North--Holland, Amsterdam 1978.
BRIDGES, D. S.: Computability, A Mathematical Sketch book, Springer--Verlag 1994

**Course language:**

**Course assessment**
Total number of assessed students: 233

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40.77 | 11.59 | 15.02 | 6.87 | 6.44 | 19.31 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚTVŠ/ TVa/11 | **Course name:** Sports Activities I. |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 1.

**Course level:** I., I.II., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 10457

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 88.25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.02 | 7.81 | 3.92 |

**Provides:** Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., PaedDr. Jana Potočníková, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., Mgr. Marcel Čurgali, doc. PhDr. Ivan Šulc, CSc.

**Date of last modification:** 23.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚTVŠ/ TVb/11 | **Course name:** Sports Activities II. |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2.

**Course level:** I., I.II., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 9779

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 85.09 | 0.61 | 0.02 | 0.0 | 0.0 | 0.02 | 10.36 | 3.9 |

**Provides:** Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., PaedDr. Jana Potočníková, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., Mgr. Marcel Čurgali, doc. PhDr. Ivan Šulc, CSc.

**Date of last modification:** 23.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚTVŠ/ TVc/11 | **Course name:** Sports Activities III. |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 3.

**Course level:** I., I.II., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 6188

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 89.66 | 0.03 | 0.0 | 0.0 | 0.0 | 0.0 | 4.36 | 5.95 |

**Provides:** PaedDr. Jana Potočníková, PhD., Mgr. Marcel Čurgali, Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., doc. PhDr. Ivan Šulc, CSc.

**Date of last modification:** 23.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚTVŠ/ TVd/11 | **Course name:** Sports Activities IV. |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 4.

**Course level:** I., I.II., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 4644

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 85.66 | 0.32 | 0.04 | 0.0 | 0.0 | 0.0 | 6.61 | 7.36 |

**Provides:** Mgr. Marcel Čurgali, Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., PaedDr. Jana Potočníková, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., doc. PhDr. Ivan Šulc, CSc.

**Date of last modification:** 23.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ UGR1/15 | **Course name:** Introduction to computer graphics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To provide the students with knowledge of graphics algorithms and basic principles of computer graphics.

**Brief outline of the course:**
Graphics hardware, input and output devices. Color models, palettes. Raster graphics algorithms for drawing 2D primitives. Filling and clipping. Curve modeling, interpolations and approximations, spline forms, Bézier curves, B-splines, surfaces. Homogenous coordinates, affine transformations, perspective and parallel projections. Visible-surface determination, illumination and shading. Rendering techniques, photorealism, textures, ray tracing, radiosity. Object representations, computer animation, virtual reality.

**Recommended literature:**
FOLEY, J. D., van DAM, A., FEINER, S., HUGHES, J.: Computer Graphics: Principles and Practice, Addison-Wesley, 1991
MORTENSON, M.E.: Geometric modeling, 2.ed., Willey, 1997

**Course language:**

**Course assessment**
Total number of assessed students: 273

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14.65 | 8.79 | 13.55 | 23.08 | 30.77 | 9.16 |

**Provides:** doc. RNDr. Gabriel Semanišin, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ UNS1/15 | **Course name:** Introduction to neural networks |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1.

**Course level:** I., II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To understand and to know applications of basic paradigms of neural networks. To learn working with software for neural network models.

**Brief outline of the course:**
Basic models of computational units - neurons (linear threshold gates, polynomial threshold gates, perceptrons), their computational capability, algorithms of adaptations. Feed-forward neural networks, back propagation algorithm. Hopfield neural networks. ART neural networks. Using neural networks to solving of problems. Genetic and evolution algorithms.

**Recommended literature:**
J. Hertz, A.Krogh, R.G. Palmer: Introduction to the theory of neural computation, Addison Wesley, 1991
HASSOUN, M. H.: Fundamentals of artificial neural networks, The MIT Press, 1995

**Course language:**

**Course assessment**
Total number of assessed students: 393

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 9.92 | 16.03 | 23.66 | 20.87 | 24.68 | 4.83 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc., RNDr. Ľubomír Antoni, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPPaPZ/UPR/03 | **Course name:** The Art of Aiding by Verbal Exchange |

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 4.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 49

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 85.71 | 4.08 | 2.04 | 2.04 | 2.04 | 4.08 |

**Provides:** Mgr. Ondrej Kalina, PhD.

**Date of last modification:** 16.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

**Course ID:** ÚINF/ UUI1/15

**Course name:** Introduction to artificial intelligence

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
home work and written tests
final exam

**Learning outcomes:**
The goal of the course is to achieve basic information about artificial intelligence techniques. For a student it is possible to study more deeply from literature, if needed.

**Brief outline of the course:**
Goal of artificial intelligence, natural intelligence, edges of agent machine intelligence, knowledge representation in AI (semantic networks, frames), reasoning. Problem solving in status space - non-informed versus informed deep and wide search, A*, solving of problems described as the game, iterative enhancement algorithms, problem solving by decomposition. Planning and scheduling, constraint logic programming, machine learning, computer vision - image recognition (flag described objects recognition, structural scene analysis), image preprocessing, image representation and describtion, object recognition. Natural language processing, artificial neural networks, knowledge systems (structure, charakteristcs, direct and backward reasoning, working with vague information), genetic algorithms, distributed artificial intelligence and multi-agent systems.

**Recommended literature:**
Russell S.J., Norvig P: Artificial Intelligence: A Modern Approach (2nd Edition), Prentice Hall, 2002, ISBN: 0137903952
Negnevitsky Michael: Artificial Intelligence: A Guide to Intelligent Systems (2nd Edition), Addison Wesley, 2004, ISBN: 0321204662
Luger George: Artificial Intelligence: Structures and Strategies for Complex Problem Solving (5th Edition), Addison Wesley, 2004, ISBN: 0321263189

**Course language:**

**Course assessment**
Total number of assessed students: 89

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 65.17 | 16.85 | 12.36 | 3.37 | 2.25 | 0.0 |

| |
|---|
| **Provides:** doc. Ing. Norbert Kopčo, PhD. |
| **Date of last modification:** 07.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ VEP1/15 | **Course name:** Formal methods in a verification |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 30

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 33.33 | 23.33 | 16.67 | 16.67 | 3.33 | 6.67 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc., Mgr. Alexander Szabari, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ VHSP/17 | **Course name:** Výpočty v prostredí SAP HANA |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 0 / 2 **Per study period:** 0 / 28<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| abs | n |
|---|---|
| 0.0 | 0.0 |

| |
|---|
| **Provides:** Ing. Miron Kuzma, PhD. |
| **Date of last modification:** 29.06.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

**Course ID:** ÚMV/ VKM/10 | **Course name:** Selected topics in mathematics

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Awarded according to tests during semester (40 points), written exam (20 points), oral exam (40 points).

**Learning outcomes:**
Students learn the fundamentals of probability theory, random processes, algebra of polynomials, linear and integer optimalization. The emphasis is on practical applications.

**Brief outline of the course:**
Probability: classical definition, conditional probability, characteristics of random variables, geometrical probability.
Random processes, Markov chains.
Polynomials over a field. Decomposition into irreducible factors. Roots of polynomials.
Formulation of linear and integer programs. Graphic solution. Simplex method. Duality. Algorithm for integer programming.

**Recommended literature:**
G. Birkhoff, S. MacLane: Prehľad modernej algebry, Alfa Bratislava, 1979
T. Katriňák a kol.: Algebra a teoretická aritmetika 1, Alfa Bratislava, 1985
Plesník, Dupáčová, Vlach: Lineárne programovanie, Alfa, Bratislava 1990
Riečan a kol.:Pravdepodobnosť a matematická štatistika, Alfa, Bratislava, 1984
Skřivánková V.: Pravdepodobnosť v príkladoch, UPJŠ, Košice, 2006

**Course language:**
Slovak

**Course assessment**
Total number of assessed students: 53

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 18.87 | 18.87 | 22.64 | 15.09 | 22.64 | 1.89 |

**Provides:** doc. RNDr. Miroslav Ploščica, CSc., doc. RNDr. Roman Soták, PhD.

**Date of last modification:** 22.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

**Course ID:** ÚINF/ VKN/15

**Course name:** Computational and cognitive neuroscience

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 2 **Per study period:** 28 / 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
project, exam

**Learning outcomes:**
Advanced topics in study of the central nervous system and cognitive processes in human, with focus on computational concepts important in the study of cognitive and neural sciences. Prerequisite: Intro to Neurosicence

**Brief outline of the course:**
Selected topics in cognitive science (following up on Intro to Neuroscience). Overview of the methods of theoretical study in cognitive and neural science, including connectionistic, statistical and system-theory principles in modeling of cognitive processes and neural circuits. Selected models of the human visual and auditory systems, learning, thinking, attention, development and plasticity.

**Recommended literature:**
HERTZ, J., KROGH, A. and PALMER R. G.: Introduction to the theory of neural computation. Addison-Wesley 1991
KANDEL, E. R., SCHWARTZ, J. H. and JESSELL, T.M.: Principles of Neural Science. McGraw-Hill, 2000
DAYAN, P. and ABBOTT, L. F.: Theoretical Neuroscience – Computa-tional and Mathematical Modeling of Neural Systems. MIT Press, 2001

**Course language:**
Slovak or English

**Course assessment**
Total number of assessed students: 5

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40.0 | 20.0 | 40.0 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. Ing. Norbert Kopčo, PhD., Ing. Beáta Tomoriová, PhD.

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ VYU1/15 | **Course name:** Computational learning |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Recognition, oral examination.

**Learning outcomes:**
To provide the students basic knowledge about computational learning algorithms.

**Brief outline of the course:**
Concepts, hypotheses, learning algorithms. Boolean formulae and representation, learning algorithms for disjunctions. Probabilistic learning, consistent algorithms and learnability, efficient learning, probably approximately correct (PAC) learning, Occam algorithms, Vapnik-Cervonenkis (VC) dimension and learning algorithms.

**Recommended literature:**
M. Anthony, N. Biggs: Computational Learning Theory, Cambridge University Press, 1991.
M. J. Kearns, U. V. Vazirani: An Introduction to Computational Learning Theory, MIT Press London, 1994.

**Course language:**

**Course assessment**
Total number of assessed students: 18

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22.22 | 22.22 | 33.33 | 5.56 | 16.67 | 0.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ VYZ1/15 | **Course name:** Computational complexity |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**
Oral examination.

**Learning outcomes:**
To give the students the theoretical background in computational complexity and theory of NP-completeness.

**Brief outline of the course:**
Deterministic and nondeterministic algorithms with polynomial time, NP-completeness. Deterministic simulation of a nondeterministic Turing machine. Satisfiability of Boolean formulae. Another NP-complete problems: satisfiability of a formula in a conjunctive normal form, 3-satisfiability, 3-colorability of a graph, 3-colorability of a planar graph, knapsack problem, balancing, ... Space bounded computations, classes L, NL, PSPACE. Deterministic simulation - Savitch theorem. Closure under complement.
Complete problems for classes NL, P, and PSPACE.

**Recommended literature:**
J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2007.
M. Sipser: Introduction to the Theory of Computation, Thomson, 2nd edition, 2006.
L.A.Hemaspaandra, M.Ogihara: Complexity theory companion, EATCS series, texts in computer science, Springer-Verlag, 2002.
S. Arora, B. Barak: Computational Complexity: A Modern Approach, Cambridge Univ. Pess, 2009.
G.Brassard, P.Bradley: Fundamentals of algorithmics, Prentice Hall, 1996.
D.P.Bovet, P.Crescenzi: Introduction to the theory of complexity, Prentice Hall, 1994.
C. Calude and J. Hromkovič: Complexity: A Language-Theoretic Point of View, in G. Rozenberg and A. Salomaa, Handbook of Formal Languages II, Springer, 1997.

**Course language:**

**Course assessment**
Total number of assessed students: 296

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 57.77 | 14.86 | 11.15 | 7.77 | 8.11 | 0.34 |
| **Provides:** prof. RNDr. Viliam Geffert, DrSc. | | | | | |
| **Date of last modification:** 07.02.2017 | | | | | |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. | | | | | |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ ZNA1/15 | **Course name:** Foundations of knowledge systems |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
The goal is to teach students some advanced applications of logic into computer science, especially in database and knowledge systems.

**Brief outline of the course:**
Logic formulas, semantic, models and logical inference. Herbrand model, construction and usability. SLD-resolution and query, SLD trees. Logic and databases, relational databases, deductive databases. Logic and expert systems. Basic notions of Lattice Theory and Formal Concept Analysis (FCA). Basic notions of Fuzzy logic and Fuzzy extension of FCA. Optimal table decomposition, factorisation. Intercontextual structures, bonds.

**Recommended literature:**
Shawn Hedman. A first course in logic: An introduction to model theory, proof theory, computability and complexity. Oxford university press, ISBN 0–19–852980–5, 2006.
Shan-Hwei Nienhuys-Cheng, Ronald de Wolf. Foundations of Inductive Logic Programming. Springer-Verlag, ISBN 3-540-62927-0, 1997.
Kristian Kersting. An Inductive Logic Programming Approach to Statistical Relational Learning, IOS Press, ISBN 1-58603-674-2, 2006.
Nilsson U., Maluszynski J.: Logic, Programming and Prolog, John Wiley & Sons Ltd. 1995.
Bělohlávek R.: Fuzzy Relational Systems: Foundations and Principles. Kluwer, Academic/ Plenum Publishers, New York, 2002.
Ganter B., Wille R.: Formal Concept Analysis: Mathematical Foundations, Springer Berlin, 1999.

**Course language:**

**Course assessment**
Total number of assessed students: 43

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 37.21 | 4.65 | 25.58 | 11.63 | 13.95 | 6.98 |

**Provides:** doc. RNDr. Stanislav Krajči, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 07.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ZTSP/14 | **Course name:** Essentials of the SAP Technology |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Defining mySAP Technology (Products, Innovations provided by SAP), Navigation (Logon, Screen Design, Calling Functions), System Kernel (Client/Server Architecture, Structure of an SAP system, Processing in SAP), Communication and Integration Technologies (Remote Function Calls, Internet Technologies).

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 163

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** Ing. Katarína Ninášová, RNDr. Štefan Pero, Ing. Slávka Šimková, PhD., RNDr. Edita Vojtová

**Date of last modification:** 09.02.2017

**Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚTVŠ/ ÚTVŠ/CM/13 | **Course name:** Seaside Aerobic Exercise |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 36s<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I., II. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 15 | |

| abs | n |
|---|---|
| 26.67 | 73.33 |

| |
|---|
| **Provides:** Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD. |
| **Date of last modification:** 23.02.2017 |
| **Approved:** Guaranteeprof. RNDr. Viliam Geffert, DrSc. |