# CONTENT

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/OPSP/16 | **Course name:** ABAP and Object and Dialogue Programming |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 6., 8.

**Course level:** I., N

**Prerequisities:** 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:**

**Notes:**

**Course assessment**
Total number of assessed students: 29

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 48.28 | 3.45 | 20.69 | 17.24 | 0.0 | 10.34 |

**Provides:** Mgr. Karol Seman

**Date of last modification:** 05.06.2016

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ AIX1a/15 | **Course name:** Administration of IBM AIX/Tivoli |

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 0 / 2 **Per study period:** 0 / 28
**Course method:** present

**Number of ECTS credits:** 2

**Recommended semester/trimester of the course:** 3., 5.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 71.21 | 24.24 | 4.55 | 0.0 | 0.0 | 0.0 |

**Provides:** RNDr. Tomáš Horváth, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/AIX1b/15 | **Course name:** Administration of IBM AIX/Tivoli |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 0 / 2 **Per study period:** 0 / 28
**Course method:** present

**Number of ECTS credits:** 2

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 43

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 65.12 | 13.95 | 11.63 | 2.33 | 6.98 | 0.0 |

**Provides:** RNDr. Tomáš Horváth, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ ASSP/16 | **Course name:** Administration of the SAP System |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 / 1 **Per study period:** 28 / 14<br>**Course method:** present | |
| **Number of ECTS credits:** 3 | |
| **Recommended semester/trimester of the course:** 4., 6. | |
| **Course level:** I., N | |
| **Prerequisities:** ÚINF/ZLSP/16 | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:**<br>Fundamentals (System Logon, Configuring SAP Logon), Starting and Stopping (Starting SAP/ Database, Stopping SAP / Database), System configuration (Parameters in SAP, Parameters in Database, Background Tasks(Scheduling Background Jobs, Monitoring of Background Jobs), Database Administration (Extend Tablespaces). | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |
| **Course assessment**<br>Total number of assessed students: 48 | |

| abs | n |
|---|---|
| 91.67 | 8.33 |

| | |
|---|---|
| **Provides:** | |
| **Date of last modification:** 05.06.2016 | |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRR1a/15 | **Course name:** Advanced programming |
|---|---|

**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 ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 52.94 | 5.88 | 8.82 | 4.41 | 22.06 | 5.88 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRR1b/15 | **Course name:** Advanced programming |
|---|---|

**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 ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 42

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 47.62 | 4.76 | 0.0 | 21.43 | 16.67 | 9.52 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ ASU1/15 | **Course name:** Algorithms and data structures |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 / 1 **Per study period:** 28 / 14<br>**Course method:** present | |
| **Number of ECTS credits:** 4 | |
| **Recommended semester/trimester of the course:** 6. | |
| **Course level:** I. | |
| **Prerequisities:** (ÚINF/PAZ1a/15 or ÚINF/ePAZ1a/15) and (ÚINF/PAZ1b/15 or ÚINF/ ePAZ1b/15) | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 125

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 12.8 | 6.4 | 17.6 | 23.2 | 36.8 | 3.2 |

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|---|
| **Provides:** RNDr. Rastislav Krivoš-Belluš, PhD. |
| **Date of last modification:** 03.05.2015 |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

**Course ID:** ÚFV/ANM/13 | **Course name:** Applications of Numerical Methods

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 3., 5.

**Course level:** I.

**Prerequisities:** ÚMV/MZIb/10

**Conditions for course completion:**
Continuous evaluation is based on students' activity in the classroom and work on assignments.
Evaluation

**Learning outcomes:**
To acquaint students with basic numerical methods of calculus and algebra, which are necessary for the subsequent course of computational physics.

**Brief outline of the course:**
Computational solutions of physical problems and computational errors. Approximation and interpolation of functions. Fast Fourier transform. Linear systems of equations - direct and itterative methods. Nonlinear systems of equations. Conditions of convergence and assesment of error. Numerical derrivatives and quadrature. Matrix operations, determinants and inverse matrices. Eigenvalues and eigenvectors - partial and complete problem.

**Recommended literature:**
1. C. Pozrikidis: Numerical Computation in Science and Engineering, Oxford University Press, 1998.
2. R.W. Hamming: Numerical Methods for Scientists and Engineers, Dover, 1973.
3. A.L. Garcia: Numerical Methods for Physics, Prentice-Hall, 1994.

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 25

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0.0 | 12.0 | 8.0 | 32.0 | 44.0 | 4.0 |

**Provides:** doc. RNDr. Milan Žukovič, PhD.

**Date of last modification:** 25.09.2017

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ AFJ1a/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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
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 hierarchy of grammars and languages. Finite-state transducers and mapping, construction of a reduced automaton. Finite-state acceptors, nondeterministic acceptors, regular expressions. Closure properties of regular languages. Context-free grammars, Chomsky and Greibach normal forms. Pushdown automata, Pumping lemma. Closure properties of context-free 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:**

**Notes:**

**Course assessment**
Total number of assessed students: 821

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 25.33 | 17.9 | 23.87 | 18.03 | 9.74 | 5.12 |

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

**Date of last modification:** 24.08.2018

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ BPO/14 | **Course name:** Bachelor 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 ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 81

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 45.68 | 24.69 | 16.05 | 8.64 | 4.94 | 0.0 |

**Provides:**

**Date of last modification:** 09.01.2019

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ ZTC1/15 | **Course name:** Basic methods in chaos 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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

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

**Provides:** doc. Ing. Štefánia Gallová, CSc.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ ZDD1/15 | **Course name:** Basic methods of data minig |
|---|---|

**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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 5., 7.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Final project and examination

**Learning outcomes:**
Understanding of basic concepts from the areas of data mining and machine learning and basic usage of freely available softwares.

**Brief outline of the course:**
During the course, students become familiar with the following concepts: regression vs. classification; modeling; overfitting vs. underfitting and regularization; CRISP-DM methodology; data pre-processing: sampling, dimensionality reduction, validation of a model; basic data types: relational vs. multi-relational, time-series; different applications and basics of freewares such as for example Weka and RapidMiner.

**Recommended literature:**
1. Jiawei Han, Micheline Kamber, Jian Pei. Data Mining: Concepts and Techniques. Morgan Kaufmann, ISBN 978-0123814791, 2011.
2. Pang-Ning Tan, Michael Steinbach, Vipin Kumar. Introduction to Data Mining. Addison-Wesley, ISBN 978-0321321367, 2005.
3. Ethem Alpazdin. Introduction to Machine Learning, The MIT Press, ISBN 978-0-262-01211-9, 2004.

**Course language:**

**Notes:**

**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:** doc. RNDr. Csaba Török, CSc., RNDr. Tomáš Horváth, PhD.

**Date of last modification:** 03.05.2015

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|---|
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ ZBSIM/13 | **Course name:** Basics of Molecular Simulation |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Written test and elaboration of referate.
Exam.

**Learning outcomes:**
Introducttion to the principles of computational simulations of biomolecular objects from point of view of komplex IT application in practice.

**Brief outline of the course:**
Essential structural characteristics of biomolecules. Foldamers - the definition and its importance. Computational predictions of folding as optimization problem. Propagators - algorithms for the time evolution and their use in molecular dynamics. Monte Carlo methods - algorithms and paralelisation. Computational challenges of biomolecular simulations - description of chemical reactions, free energy evaluation, protein folding. Simulations of rare events. Computational complexity, less traditional optimization techniques and heuristics.

**Recommended literature:**
- Schlick, Tamar. Molecular Modeling and Simulation. 1st ed. Springer, 2002.
- Allen, M. P., and D. J. Tildesley. Computer Simulation of Liquids. Oxford University Press, USA, 1989.

**Course language:**

**Notes:**

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

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

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 5., 7.

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

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

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ POF1a/99 | **Course name:** Computational Physics I |
|---|---|

**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 ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** ÚFV/NUM/10

**Conditions for course completion:**
Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination and assignments submitted electronically with the attached computer code.

**Learning outcomes:**
To teach students to use computer as a tool of modeling of physical reality.

**Brief outline of the course:**
Introduction to dynamical systems. Numerical solution of ordinary differential equations (ODE) with initial value. Boundary value problems for ODE. Discrete schemes for partial differential equations (PDE). Numerical solution of PDE. Finite difference methods, consistency, convergence, stability. Eliptic and parabolic PDE. Introduction to Monte Carlo (MC) method and applicactions in statistical physics.

**Recommended literature:**
1. C. Pozrikidis: Num. Comp. in Science and Engineering, Oxford Univ. Press, 1998.
2. A.L. Garcia: Numerical Methods for Physics, Prentice-Hall, 1994.
3. D. P. Landau, K. Binder: A Guide to Monte Carlo Simulations in Statistical Physics, Cambridge Univ. Press, 2000.
4. B. A. Berg: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis, http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf
5. W. Janke: Lectures on Ising model, http://www.physik.uni-leipzig.de/~janke/Ising_Lectures_Lviv.html

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 111

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 33.33 | 17.12 | 9.91 | 17.12 | 13.51 | 3.6 | 0.9 | 4.5 |

**Provides:** doc. RNDr. Milan Žukovič, PhD.

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| **Date of last modification:** 14.04.2020 |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ POF1b/99 | **Course name:** Computational Physics II |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 5.

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

**Prerequisities:**

**Conditions for course completion:**
Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination and assignments submitted electronically with the attached computer code.

**Learning outcomes:**
To teach students to create simulation projects to help to solve physical problems.

**Brief outline of the course:**
Advanced methods of Monte Carlo (MC) simulations of lattice spin systems. Local and cluster perturbation algorithms. Errors and histogram analysis of MC data. Reweighting by simple and histogram methods. Universality and finite-size scaling. Determination of order of phase transitions and calculation of critical exponents. Basics of quantum MC simulations. MC simulations of stochastic processes. Diffusion equation. Stochastic processes in financial analysis. Basics of molecular dynamics method.

**Recommended literature:**
1. D.P. Landau, K. Binder: A Guide to Monte Carlo Simulations in Statistical Physics, Cambridge University Press, 2000.
2. B.A. Berg: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis, http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf
3. W. Janke: Lectures on Ising model, http://www.physik.uni-leipzig.de/~janke/Ising_Lectures_Lviv.html

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 51

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 52.94 | 17.65 | 15.69 | 9.8 | 1.96 | 1.96 |

**Provides:** doc. RNDr. Milan Žukovič, PhD.

**Date of last modification:** 25.09.2017

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PSIN/15 | **Course name:** Computer network Internet |

**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 ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:** ÚINF/PAZ1a/15 or ÚINF/ePAZ1a/15 or ÚINF/PRG1/15

**Conditions for course completion:**
Activity at excercises (max 18 points), home work (max 18 points), test (max 30 points).
Verbal exam (min 25 points, max 50 points). Required minimum for passing the course is 64 points.

**Learning outcomes:**
To understand ISO OSI reference model for network communication, to analyze communication channels parameters, to understand different access methods, to be familiar with the function of center network devices (hub, switch, router), to understand IP protocol, IP addresses and the transfer of internet packets, to understand reliable data transfer of the TCP protocol, to be able to use Sockets in won application, to know basic application protocols.

**Brief outline of the course:**
1. Introduction to computer networks, internet connection types, delay and loss in packet-switched networks, ISO OSI reference model and TCP/IP protocols family.
2. Application layer: Web and HTTP, protocol FTP ,e-mail and SMTP, POP3, IMAP,
3. Application layer: domain names and DNS, Peer-to-peer applications. Security in computer networks.
4. Transport layer: services, multiplexing and demultiplexing, protocol UDP, reliable data transfer
5. Transport layer: connection oriented transport protocol TCP, flow and congestion control.
6. Network Layer: Internet protocol IPv4, virtual circuit and datagram networks, packet fragmentation, routing table, application protocol DHCP
7. Network Layer: network address translation NAT, ICMP protocol, internet protocol IPv6
8. Network Layer: routing algorithms and protocols, broadcast and multicast routing
9. Link layer: error detection, multiple access methods CSMA/CD and CSMA/CA, Ethernet, frames, protocols ARP and RARP, link layer addressing
10. Link Layer and wireless and mobile networks: hub, switch, virtual LAN, 802.11 Wireless LAN, Bluetooth 802.15, WiMAX 802.16, Mobile IP, mobility in GSM
11. Physical Layer: Communication channels parameters, digital and analog encoding.

**Recommended literature:**
1. J. F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach, 7. edition, 2016
2. A. S. Tanenbaum: Computer Networks, 5. edition, Pearson, 2010
3. W. Stallings: Local and Metropolitan Area Networks, Prentice Hall, 2000

4. E. Comer, R.E. Droms: Computer Networks and Internets, Prentice Hall, 2003
5. W. R. Stevens: TCP/IP Illustrated, Vol.1: The Protocols, Addison-Wesley, 1994

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 743

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 9.69 | 5.11 | 11.84 | 16.42 | 37.01 | 19.92 |

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

**Date of last modification:** 06.02.2019

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/KOPR/15 | **Course name:** Concurrent programming |
| **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 ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 5., 7. | |
| **Course level:** I. | |
| **Prerequisities:** ÚINF/PAZ1a/15 or ÚINF/ePAZ1a/15 | |
| **Conditions for course completion:**<br>Final projects in area of parallel and distributed programming | |
| **Learning outcomes:**<br>Ability to create thread safe programs, cooperation and synchronization of threads, design pattern "Work stealing", interruption of threads. Technologies SOAP and Akka. | |
| **Brief outline of the course:**<br>1, Introduction to threads<br>2, Stale data and data publication<br>3, Composing thread safe classes<br>4, Concurrent collections<br>5, Thread coordination<br>6, Executors<br>7, ForkJoinPool - work stealing pattern<br>8, Tasks cancellation<br>9, Threads in JavaFx<br>10, SOAP Web Services - From code to WSDL<br>11, SOAP Web Services - From WSDL to code<br>12, Actor model and Akka | |
| **Recommended literature:**<br>1. B. Goetz, Tim Peierls, Joshua Bloch, Joseph Bowbeer, David Holmes, Doug Lea: Java Concurrency in Practice; Addison-Wesley Professional, 2006<br>2. P. Hyde: Java Thread Programming; Sams, 1999<br>3. T. White: Hadoop: The Definitive Guide; Yahoo Press; Second Edition edition, 2010 | |
| **Course language:** | |
| **Notes:** | |

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 44.12 | 25.0 | 14.71 | 11.76 | 4.41 | 0.0 |

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

**Date of last modification:** 05.02.2019

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DBdi/15 | **Course name:** Database and information 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 ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 45.45 | 18.18 | 0.0 | 0.0 | 36.36 | 0.0 |

**Provides:** doc. RNDr. Csaba Török, CSc., Mgr. Maroš Andrejko

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/DBS1b/15 | **Course name:** Database systems |
|---|---|

**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 ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:** ÚINF/DBS1a/15 or ÚINF/DBdi/15

**Conditions for course completion:**
Tests, assignments.

**Learning outcomes:**
Advanced techniques of relational databases and theoretical fundamentals of DB normalization and relational algebra. NoSQL

**Brief outline of the course:**
Stored procedures, functions. Triggers. Views. CTE, recursion and transitive closure.
Set operations. Window functions. Transactions. Cursors. B-trees and indexes. XML, JSON.
Relational algebra. Functional Dependencies and Essential Tuple NF.
Big Data and NoSQL, MongoDB, CRUD and Cursors, Aggregations and Indexes, Replication and Sharding.

**Recommended literature:**
- K. Chodorow, MongoDB: The Definitive Guide, O'Reilly, second edition, 2013
- Date C.J., Database Design and Relational Theory, O'Reilly, 2012
- Itzik Ben-Gan, Microsoft SQL Server, 2012 T-SQL Fundamentals, O'Reilly, 2012
- L. Davidson, J.M. Moss, Pro SQL Server 2012 Relational database Design and Implementation, APRESS, 2012

**Course language:**

**Notes:**
If necessary, teaching, mid-term and final evaluation will be by distance form.

**Course assessment**
Total number of assessed students: 687

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 10.33 | 8.3 | 11.5 | 23.44 | 35.81 | 10.63 |

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

**Date of last modification:** 30.03.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 2

**Recommended semester/trimester of the course:** 5.

**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:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 21.43 | 14.29 | 28.57 | 7.14 | 28.57 | 0.0 |

**Provides:**

**Date of last modification:** 17.09.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/ DSM3a/10 | **Course name:** Discrete mathematics for informaticians |
|---|---|

**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 ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Based on results of two semestral tests.
Based on semestral evaluation and the result of examination.

**Learning outcomes:**
To present the basics of combinatorics and their applications in computer science.

**Brief outline of the course:**
Mathematical induction and Dirichlet principle. The sum and the product rule. Permutations, k-permutations, combinations. Selections with repetitions. The inclusion/exclusion principle. Recurrent equations. Introduction to graph theory. Trees. Eulerian and Hamiltonian graphs. Planar graphs. Graph colourings.

**Recommended literature:**
1. S. Jendroľ, P. Mihók: Diskrétna matematika I., UPJŠ Košice 1992
2. J. Nešetřil, J. Matoušek: Kapitoly z diskrétni matematiky
3. E. R. Scheinerman: Mathematics - a discrete introduction, Brooks/Cole Publ. Comp. Pacific Grove 2000.
4. R.P. Grimaldi: Discrete and Computational Mathematics, Addison-Wesley Publ. Co.-Rending 1994.

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 615

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 4.39 | 2.6 | 5.53 | 14.8 | 50.57 | 22.11 |

**Provides:** prof. RNDr. Tomáš Madaras, PhD., RNDr. Mária Maceková, PhD.

**Date of last modification:** 22.09.2019

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** CJP/ PFAJ4/07 | **Course name:** English Language of Natural Science |

**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 ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Active participation in class and completed homework assignments. Students are allowed to miss 2 classes at the most.
Continuous assessment: 2 credit tests (presumably in weeks 6 and 13) and academic presentation in English.
In order to be admitted to the final exam, a student has to score at least 65 % as a sum of both credit tests.
The exam test results represent 50% of the final grade for the course, continuous assessment results represent the other 50% of the final grade.
The final grade for the course will be calculated as follows:
A 93-100, B 86-92, C 79-85, D 72-78, E 65-71, FX 64 and less.

**Learning outcomes:**
Enhancement of students' language skills (speaking, writing, reading and listening comprehension) in English for specific purposes and development of students' language competence (familiarization with selected phonological, lexical and syntactic phenomena), improvement of students' pragmatic competence (familiarization with selected language functions) and improvement of presentation skills at B2 level (CEFR) with focus on terminology of English for natural science.

**Brief outline of the course:**
ANGLICKÝ JAZYK PRE GEOGRAFOV:
Veda a výskum. Odbor geografia.
Planéta Zem. Naša slnečná sústava.
Zemetrasenia, Sopečná činnosť.
Svetové oceány a ľadovce.
Životné prostredie a geografia.
Počasie a klíma.
ANGLICKÝ JAZYK PRE EKOLÓGOV:
Veda a výskum. Odbor ekológia.
Životné prostredie. Znečistenie a dôsledky.
Sopečná činnosť, zemetrasenia.
Great Pacific Garbage Patch.

Globálne otepľovanie a dôsledky. Ľadovce.
Počasie a klíma. Búrky, hurikány, tsunami.
Život na Zemi. Ohrozené rastlinné a živočíšne druhy.
ANGLICKÝ JAZYK PRE BIOLÓGOV:
veda a výskum, odbor biológia.
morfológia rastlín, koreň.
stonka, list.
rozmnožovanie rastlín, kvet.
biológia človeka - telesné sústavy.
slovná zásoba z oblasti botanickej a zoologickej nomenklatúry.
ANGLICKÝ JAZYK PRE MATEMATIKOV:
Veda a výskum, odbor matematika.
čísla a tvary v matematike.
Elementárna algebra.
Elementárna geometria.
Výpočty v matematike.
Pytagoras, Pytagorova veta.
Grafy a diagramy.
Štatistika.
ANGLICKÝ JAZYK PRE FYZIKOV
Veda a výskum, odbor fyzika.
Atómy a molekuly.
Hmota a jej premeny.
Elektrina, jej využitie.
Zvuka, jeho prenos.
Svetlo.
Solárny systém.
Matematické operácie.
ANGLICKÝ JAZYK PRE CHEMIKOV:
Veda a výskum, odbor chémia.
História, Každodenná chémia.
Laboratórium a jeho vybavenie.
Periodická tabuľka.
Hmota a jej premeny.
Životné prostredie a chémia.
ANGLICKÝ JAZYK PRE INFORMATIKOV:
Veda a výskum, informatika.
Život s počítačom.
Typický PC.
Zdravie a bezpečnosť, ergonomika.
Programovanie.
Emailovanie.
Cybercrime.
Trendy budúcnosti.

**Recommended literature:**

study materials provided by the course instructor
Redman, S.: English Vocabulary in Use, Pre-intermetdiate, Intermediate. Cambridge University Press, 2003.
Armer, T.: Cambridge English for Scientists. CUP, 2011.

Wharton J.: Academic Encounters. The Natural World. CUP, 2009.
Murphy, R.: English Grammar in Use. Cambridge University Press, 1994.
P. Fitzgerald : English for ICT studies. Garnet Publishing, 2011.
https://worldservice/learningenglish, https://spectator.sme.sk
www.isllibrary.com

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 2582

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 36.91 | 25.17 | 17.04 | 10.3 | 8.37 | 2.21 |

**Provides:** PaedDr. Gabriela Bednáriková, Mgr. Zuzana Naďová, Mgr. Oľga Lešková, PhDr. Marianna Škultétyová

**Date of last modification:** 08.02.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ABSP/16 | **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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 5., 7.

**Course level:** I., N

**Prerequisities:** ÚINF/ZTSP/16

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 54

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 31.48 | 42.59 | 20.37 | 1.85 | 0.0 | 3.7 |

**Provides:** RNDr. Štefan Pero, PhD., Mgr. Karol Seman

**Date of last modification:** 24.08.2016

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ZTSP/16 | **Course name:** Essentials of the SAP Technology |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 0 / 2 **Per study period:** 0 / 28
**Course method:** present

**Number of ECTS credits:** 2

**Recommended semester/trimester of the course:** 3., 5.

**Course level:** I., N

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 315

| abs | n | neabs |
|---|---|---|
| 96.51 | 1.27 | 2.22 |

**Provides:** Ing. Katarína Ninášová, Ing. Slávka Šimková, PhD., RNDr. Edita Vojtová

**Date of last modification:** 24.08.2016

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/FUN1/15 | **Course name:** Functional programming |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 7.

**Course level:** I.

**Prerequisities:** ÚINF/PAZ1a/15 or ÚINF/ePAZ1a/15

**Conditions for course completion:**

**Learning outcomes:**
To learn bases of declarative programming (as complementary method to procedural programming) and basic methods of implementations of functional programming languages.

**Brief outline of the course:**
Principles of functional programming. Lambda calculus from the functional programming languages point of view. Properties of functional programming languages. Programming language Haskell: the structure of the language and basic computational rule, basic data types, lists, recursion and induction, trees

**Recommended literature:**
BIRD, R., WADLER, P.: Introduction to Functional Programming. Prentice Hall International, 1988.
LIPOVAČA, M.: Learn You Haskell for Great Good!. Free from http://learnyouahaskell.com/

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 235

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20.85 | 12.77 | 15.74 | 15.32 | 34.47 | 0.85 |

**Provides:** doc. Ing. Štefánia Gallová, CSc.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ GRP/13 | **Course name:** GRID computing |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 8.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

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

**Provides:** Ing. Jozef Černák, PhD.

**Date of last modification:** 30.03.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚGE/ GIS/13 | **Course name:** Geographic Information Systems |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 1 / 2 **Per study period:** 14 / 28<br>**Course method:** present | |
| **Number of ECTS credits:** 4 | |
| **Recommended semester/trimester of the course:** 6. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Active presence during practicals, mid-term written test, project assignment and final written exam. | |
| **Learning outcomes:**<br>The student will understand the basics of the theory of geoinformation science, GIS, and Remote Sensing. The student will be able perform tasks in a GIS software, generate thematic amps and conduct basic spatial analyses such as spatial querries, atribute querries, spatial interpolation, terrain modelling, editing custom geodata, importing geodata, 3D vizualization. | |
| **Brief outline of the course:**<br>Introduction to GIS and geoinformation problematic, basics of geoinformatics, principals of vector and raster representation, surfaces – digital terrain models, organisation of work in projects, system implementation, data sources and data input, data structuring, data analysing, digital image processing, process of layout creation, data quality and metadata, standardisation the digital data and legislation, GIS software products (ArcGIS and relevant ESRI products, Geomedia and Intergraph products, MapInfo, Topol), applications in a geography field in Slovakia, development trends in GIS and geoinformation field. | |
| **Recommended literature:**<br>HEYWOOD, I., CORNELIUS, S., CARVER, S. 2011: An Introduction to Geographical Information<br>Systems. Prentice Hall.<br>GEOinformatics, http:// www.geoinformatics.com<br>http://www.esri.com/<br>http://www.osgeo.org/ | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 24

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 29.17 | 29.17 | 12.5 | 16.67 | 12.5 | 0.0 |

**Provides:** doc. Mgr. Michal Gallay, PhD., prof. Mgr. Jaroslav Hofierka, PhD.

**Date of last modification:** 22.02.2017

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 5., 7.

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 25

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 12.0 | 20.0 | 24.0 | 8.0 | 36.0 | 0.0 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ IBdi/15 | **Course name:** Information security principles |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 28

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 25.0 | 21.43 | 25.0 | 10.71 | 3.57 | 14.29 |

**Provides:** RNDr. JUDr. Pavol Sokol, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/MAIN/15 | **Course name:** Interdisciplinary applications of informatics |
| **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 ECTS credits:** 4 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I. | |
| **Prerequisities:** (ÚINF/ANO/15 or ÚINF/AFJ1a/15) and (ÚINF/ASU1/15 or ÚFV/POF1b/99 or ÚFV/UPF1/12) and (ÚINF/UNS1/15 or ÚINF/UNV1/15 or ÚFV/NOT1b/03) | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 5

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

| |
|---|
| **Provides:** |
| **Date of last modification:** 24.08.2018 |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ UPF1/12 | **Course name:** Introduction to Computational Physics |
|---|---|

**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 ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Elaboration of microreferat on given topics.
Exam and discussion of the implementation of the given project.

**Learning outcomes:**
The aim of the lecture is to provide students with the physical background of the computational processes in conventional computers, as well as to provide less conventional possibilities to implement computational processes using deeper knowledge of physical processes.

**Brief outline of the course:**
Physical processes utilised in contemporary computers. Computational processes / thermodynamics point of view. Physical limits of current computer technologies (Moore, Amdahl laws
. Computer modeling and physical reality. Computational complexity and paralelism. Distributed computing. Alternative methods of computation (analogue , optical processors, DNA computing, quantum computing).

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 28

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 85.71 | 10.71 | 0.0 | 0.0 | 3.57 | 0.0 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 3., 5.

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 292

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14.04 | 9.93 | 13.36 | 23.63 | 30.48 | 8.56 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/UPR1/15 | **Course name:** Introduction to law for informatics |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 7.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Written final exam (score at least 50%)

**Learning outcomes:**
To provide theoretical background for studying computer science in general, by giving the necessary knowledge in the Slovak private and public law.

**Brief outline of the course:**
(1) Introduction to concepts of law and legal theory
(2) Introduction to Civil law
(3) Introduction to Commercial law
(4) Introduction to Labor law
(5) Introduction to Administrative law
(6) Introduction to Tax law
(7) Introduction to criminal law

**Recommended literature:**
(1) Selected slovak legislation

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 25.0 | 16.67 | 16.67 | 16.67 | 25.0 | 0.0 |

**Provides:** RNDr. JUDr. Pavol Sokol, PhD.

**Date of last modification:** 14.01.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 3., 5.

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 420

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 12.38 | 16.67 | 23.33 | 19.76 | 23.33 | 4.52 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ UNV1/15 | **Course name:** Introduction to neurosciences |
|---|---|

**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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 5.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Examination

**Learning outcomes:**
Introduction to anatomy and physiology of human brain, to cognitive processes corresponding to different mental functions, and to computational tools used in neuroscience.

**Brief outline of the course:**
Description of neural centers of basic cortical functions (visual, auditory, sensory and motor cortex, learning and memory). Basic physiological, psychological, psychophysical and computational methods used in neuroscience with focus on the application of computational tools for electrophysiological brain activity recording and imaging (e.g., magnetic resonance). Computational applications of neuroscience research.

**Recommended literature:**
1. Gazzaniga M. (ed.): The New Cognitive Neurosciences. 2nd ed. MIT Press. 1999
2. Dayan P and LF Abbott: Theoretical Neuroscience - Computational and Mathematical Modeling of Neural Systems. MIT Press, 2001
3. Stillings et al.: Cognitive Science: An Introduction, 2nd ed., MIT Press, 1995

**Course language:**
Slovak or English

**Notes:**

**Course assessment**
Total number of assessed students: 26

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 19.23 | 26.92 | 19.23 | 23.08 | 11.54 | 0.0 |

**Provides:** doc. Ing. Norbert Kopčo, PhD.

**Date of last modification:** 19.10.2016

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ UIN1/15 | **Course name:** Introduction to study of informatics |
|---|---|

**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 ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 250

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40.0 | 16.8 | 15.2 | 9.6 | 3.6 | 14.8 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PAI1/13 | **Course name:** Legal aspects of informatics |
| **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 ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 4., 6. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Written final exam (score at least 50%) | |
| **Learning outcomes:**<br>To provide theoretical background for studying computer science in general, by giving the necessary knowledge in the legal aspects of information and communications technologies (ICT law). | |
| **Brief outline of the course:**<br>(1) Introduction to ICT law<br>(2) Legal acts<br>(3) Electronic signatures<br>(4) Electronic commerce<br>(5) Consumer rights<br>(6) Intelectual property and software law<br>(7) Privacy and personal data protection<br>(8) ISPs and their responsibility;<br>(9) Legal aspects of cyber security and digital forensics<br>(10) Cyber crime<br>(11) Legal aspects of domain names | |
| **Recommended literature:**<br>(1) Murray A. Information technology law: the law and society. Oxford University Press; 2013 Aug 22.<br>(2) Lloyd IJ. Information technology law. Oxford University Press; 2017.<br>(3) Acts of EU law - regulations and directives | |
| **Course language:** | |
| **Notes:** | |

| **Course assessment**<br>Total number of assessed students: 35 | | | | | |
|---|---|---|---|---|---|
| A | B | C | D | E | FX |
| 11.43 | 25.71 | 20.0 | 11.43 | 20.0 | 11.43 |
| **Provides:** RNDr. JUDr. Pavol Sokol, PhD. | | | | | |
| **Date of last modification:** 14.01.2020 | | | | | |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. | | | | | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/LOP1/15 | **Course name:** Logic programming |
|---|---|

**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 ECTS credits:** 5

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

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To learn bases of declarative programming (as complementary method to procedural programming) and basic methods of implementations of logic programming languages.

**Brief outline of the course:**
Facts and rules in Prolog. Unification of terms (Robinson's unification algorithm). Recursion and backtrack in Prolog. Computational step and computational tree. Classification of terms. Lists. Functors and operators in composed terms. Predicates for input and output. Dynamic database. Cycles (repeat-fail, for). Predicates related to backtrack. Cut. Predicates evaluating of arithmetic expressions.

**Recommended literature:**
Bratko, I.: Prolog – programming for artificial intelligence, third edition. Addison-Wesley, 2001
Nilsson U., Maluszynski J.: Logic, Programming and Prolog, John Wiley & Sons Ltd. 1995
Nienhuys-Cheng Sh.H., Wolf R.: Foundations of Inductive Logic Programming, Springer-Verlag, 1997

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 265

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.02 | 11.32 | 13.21 | 24.15 | 26.42 | 1.89 |

**Provides:** RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ MIS/15 | **Course name:** Management of information systems |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 8.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 28.57 | 50.0 | 14.29 | 0.0 | 0.0 | 7.14 |

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

**Date of last modification:** 22.05.2018

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/MZIa/10 | **Course name:** Mathematical foundations of informatics 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 ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Two tests and completion of individual homework.
Based on semestral evaluation and examination test.

**Learning outcomes:**
To obtain basic knowledge in arithmetic, linear algebra, abstract algebra and calculus, to learn proof methods and to use the obtained knowledge in problem solving.

**Brief outline of the course:**
Integers, divisibility, congruences, congruence classes. Fields and groups. Systems of linear equations, matrices, matrix operations, determinants. Functions and their properties, continuity, limit, derivative. Analysis of functions.

**Recommended literature:**
Huťka, Benko, Ďurikovič: Matematika, Alfa, Bratislava 1991
D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006
D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006
J. Ivan: Matematika 1, Alfa, Bratislava 1989
T. Katriňák a kol.: Algebra a teoretická aritmetika, Alfa, Bratislava 1986

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 215

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0.47 | 7.91 | 8.84 | 16.28 | 45.12 | 21.4 |

**Provides:** prof. RNDr. Tomáš Madaras, PhD., RNDr. Pavel Molnár, PhD.

**Date of last modification:** 03.05.2015

| |
|---|
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/MZIb/10 | **Course name:** Mathematical foundations of informatics 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 ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:** ÚMV/MZIa/10

**Conditions for course completion:**
Based on results of two tests and individual homeworks.
Based on semestral evaluation and examination test.

**Learning outcomes:**
To extend the obtained knowledge in mathematics by topics in integral calculus, differential equations and infinite series.

**Brief outline of the course:**
Indefinite and definite integral and their applications. Differential equations. Series, convergence criteria. Series of functions, Taylor expansion. Periodic functions, trigonometric series, Fourier expansion.

**Recommended literature:**
Huťka, Benko, Ďurikovič: Matematika, Alfa, Bratislava 1991
D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006
D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006
J. Ivan: Matematika 2, Alfa, Bratislava 1989
T. Katriňák a kol.: Algebra a teoretická aritmetika, Alfa, Bratislava 1986

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 107

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0.93 | 9.35 | 8.41 | 21.5 | 52.34 | 7.48 |

**Provides:** prof. RNDr. Tomáš Madaras, PhD., RNDr. Pavel Molnár, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/VKT/15 | **Course name:** Modern information technologies in applications |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 0 / 2 **Per study period:** 0 / 28
**Course method:** present

**Number of ECTS credits:** 2

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

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

**Provides:** RNDr. Peter Marcinčák

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 8.

**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:**

**Notes:**
If necessary, teaching, mid-term and final evaluation will be by distance form.

**Course assessment**
Total number of assessed students: 141

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 16.31 | 18.44 | 24.82 | 21.28 | 17.73 | 1.42 |

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

**Date of last modification:** 30.03.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/DOP1/15 | **Course name:** Multithreaded and distributed programming |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
Mastering the basics of distributed and parallel programming and design of distributed applications communicating via messages.

**Brief outline of the course:**
Multithreading, synchronization primitives. Basics of parallel programming, PLINQ, Task Parallel Library. Distributed object-oriented programming and its application. Service-oriented architecture, communication via messages. Endpoint: address, interconnections and communication channels, contracts for services, data and messages.

**Recommended literature:**
- A. S. Tanenbaum, M.V. Steen: Distributed Systems: Principles and Paradigms, Prentice Hall, 2002
- C.Campbell, R.Johnson, A.Miller, Parallel Programming with Microsoft® .NET, Microsoft, 2010
- J.Sharp, Windows Communication Foundation 4 Step by Step, O'Reilly, 2010
- J.Albahari, B.Albahari, C# 5.0 in a Nutshell: The Definitive Reference, O'Reilly, 2011

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0.0 | 30.77 | 53.85 | 7.69 | 7.69 | 0.0 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 7.

**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:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 67.11 | 18.42 | 7.89 | 2.63 | 3.95 | 0.0 |

**Provides:** RNDr. Branislav Brutovský, CSc.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 8.

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

**Prerequisities:**

**Conditions for course completion:**
Presentation of the project in written form. Oral exam and discussion of the presented project. Should corona-virus quarantine persist, written report and answer to posed questions suffice.

**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, including parasite/host coevolution.

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 43

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 88.37 | 4.65 | 4.65 | 2.33 | 0.0 | 0.0 |

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

**Date of last modification:** 27.03.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ OP/14 | **Course name:** Odborná prax |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 2t<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 3., 5. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

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

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

| |
|---|
| **Provides:** Mgr. Alexander Szabari, PhD. |
| **Date of last modification:** 03.05.2015 |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ OSY1/15 | **Course name:** Operating systems |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 / 0 **Per study period:** 28 / 0<br>**Course method:** present | |
| **Number of ECTS credits:** 3 | |
| **Recommended semester/trimester of the course:** 3. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Test and oral exam | |
| **Learning outcomes:**<br>To gain knowledge about the basic architecture of the operating system. Understand algorithms for multi-process CPU allocation, interprocess communication, and memory allocation.<br>To be able to apply basic synchronization procedures and to solve problems of allocation of common resources for I / O operations.<br>Understand the organization of files and their protection by access rights. To be able to practically use the services of the Unix and Windows operating system. | |
| **Brief outline of the course:**<br>Operating system structure and basic functions.<br>Different kinds of operating systems and their history.<br>Multiprogramming, context switching, interrupts, time sharing, interoperability.<br>Processes, process management, threads, scheduling, interprocess communication (race condition, mutual exclusion, deadlock, starvation).<br>Memory management, relocation, segmentation, paging, virtual memory.<br>I/O management, device drivers, interrupt handlers.<br>External memory (disk) - direct and sequential access.<br>File systems, file operations, directories, access control, access rights. | |
| **Recommended literature:**<br>1. A. Silberschatz, G. Gagne, P. Baer: Operating System Concepts, Wiley, 2002<br>2. A. S. Tanenbaum: Modern Operating Systems, Prentice-Hall, 2001 | |
| **Course language:** | |
| **Notes:** | |

| **Course assessment**<br>Total number of assessed students: 228 | | | | | |
|---|---|---|---|---|---|
| A | B | C | D | E | FX |
| 25.44 | 15.35 | 18.42 | 19.74 | 15.35 | 5.7 |
| **Provides:** doc. Ing. Štefánia Gallová, CSc., RNDr. PhDr. Peter Pisarčík | | | | | |
| **Date of last modification:** 14.01.2020 | | | | | |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. | | | | | |

## 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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 6.

**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:**

**Notes:**

**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., RNDr. František Galčík, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ LEK1/99 | **Course name:** Physical Principles of Medicine Technique |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 7.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 35

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 85.71 | 11.43 | 2.86 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Karol Flachbart, DrSc.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRP2/15 | **Course name:** Principles of computers |
|---|---|

**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 ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
- Know brief history of computer, classification and construction principles of computers of von Neumann type.
- Understand relation between real numbers, integers and their binary representation as well as be able to perform basic arithmetic and logic operations over binary represented numbers.
- Learn basics about logic gates, combination and sequence circuits and their structure. Understand principles of how basic circuits realize arithmetic-logic unit and other parts of computers e.g. memory.
- Know principles of communication of processor and other devices via interruptions and direct memory access.
- Get idea of device drivers, device controllers and their functionality.

**Brief outline of the course:**
Brief outline of the course:
- computers of von Neumann type,
- history of computers,
- binary encoding of real numbers and integers,
- realization of computers parts by sequence and combination circuits,
- principles of various memory cells and memory matrices,
- types of memories,
- architecture of processor on levels of digital logic, machine cycle, instruction cycle,
- input and output devices,
- principles of interruptions,
- direct memory access,
- device drivers,
- device controllers,
- peripheral devices.

**Recommended literature:**
1. W. Stallings: Computer Organization and Architecture, Prentice Hall, 2002

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 180

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 28.33 | 15.0 | 16.67 | 15.56 | 23.89 | 0.56 |

**Provides:** doc. Ing. Štefánia Gallová, CSc., RNDr. Juraj Šebej, PhD.

**Date of last modification:** 13.01.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PBS/15 | **Course name:** Pro-seminar to bachelor thesis |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 1 **Per study period:** 14<br>**Course method:** present | |
| **Number of ECTS credits:** 1 | |
| **Recommended semester/trimester of the course:** 6. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 272

| abs | n |
|---|---|
| 93.38 | 6.62 |

| |
|---|
| **Provides:** RNDr. Ľubomír Antoni, PhD., RNDr. Ondrej Krídlo, PhD. |
| **Date of last modification:** 03.05.2015 |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PMO1/15 | **Course name:** Proces modelling |
|---|---|

**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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:** ÚINF/PAZ1b/15 or ÚINF/ePAZ1b/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 32

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 15.63 | 28.13 | 25.0 | 21.88 | 0.0 | 9.38 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRG1/15 | **Course name:** Programming |
|---|---|

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

**Number of ECTS credits:** 6

**Recommended semester/trimester of the course:** 7.

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 53

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 18.87 | 11.32 | 16.98 | 13.21 | 13.21 | 26.42 |

**Provides:** PaedDr. Ján Guniš, PhD.

**Date of last modification:** 02.03.2020

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ JAC1/15 | **Course name:** Programming language C |
|---|---|

**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 ECTS credits:** 2

**Recommended semester/trimester of the course:** 5.

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

**Prerequisities:**

**Conditions for course completion:**
Practics attendance and activity. Home assigment
Final project.

**Learning outcomes:**
Become skilled in language C and get knowledge of the theoretical concepts that are used in the development in low-level software.

**Brief outline of the course:**
1. Installing and setting up the development environment. Simple program in C, compiling and running.
2. Loops, conditions. Introduction to arrays. Numeric functions from numeric library. Compiling with `gcc` and setting up the warnings and hints.
3. Functions. Statically allocated arrays. Array gotchas in C. Makefiles for complex projects.
4. Basic I/O functions. Functions with array parameters and specifics.
5. Dynamic memory allocation as a mechanism for dynamic arrays. Strings as a special case of arrays. Strings and file I/O.
6. String manipulation principles and functions from standard library.
7. Working with binary files.
8. Custom data types. Structs.
9. Dynamic data structures. Linked lists. Stacks and operations with these structs.
10. Additional operations with dynamic data structures. Parameter passing with values and name.
11. Useful tricks and hints: passing parameters from operating system, exit codes. Multidimensional arrays.
12. Function pointers. Generic pointers. Unions.

**Recommended literature:**
1. A. D. Marshall: Programming in C: UNIX System Calls and Subroutines using C. [online] <http://www.cs.cf.ac.uk/Dave/C/CE.html>
2. J. Maasen: C for Java Programmers. [online] <http://www.cs.vu.nl/~jason/college/dictaat.pdf>
3. Bruce Eckel: Thinking in C. [online] <http://mindview.net/CDs/ThinkingInC>

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 196

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 36.22 | 18.37 | 15.82 | 14.29 | 10.71 | 4.59 |

**Provides:** RNDr. PhDr. Peter Pisarčík

**Date of last modification:** 07.09.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PSW1/06 | **Course name:** Programming of web-pages |
|---|---|

**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 ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
Acquire overview about modern technologies to make dynamic web pages. Be able to make web pages with cascading styles according to W3C standards. Use technologies on server side (PHP) and on client side (JavaScript). Understand relational databases (MySQL). Understand web applications security risks and know how to eliminate them.

**Brief outline of the course:**
Principle of making web pages. HTML language, W3C standards. Optimization of work, cascading styles. Tools for creating the web. Programming in JavaScript. Simple scripts for dynamic web pages. Programming on server side, script language PHP. Application based on PHP. Work with MySQL database. Conjunction of used technologies. Selected problems resolvable by technologies on server side and on client side.

**Recommended literature:**
GILMORE, W. Jason. Beginning PHP and MySQL: from novice to professional. 4th ed. New York: Apress, 2010. ISBN 978-143-0231-141.
KOSEK, Jiří. PHP - tvorba interaktivních internetových aplikací: podrobný průvodce. Vyd. 1. Praha: Grada, 1999, 490 s. Průvodce (Grada). ISBN 80-716-9373-1.
SUEHRING, Steve a Janet VALADE. PHP, MySQL, JavaScript. Vyd. 1. Brno: Computer Press, 2006, xxiv, 692 pages. --For dummies. ISBN 978-1-118-21370-4.
HUSEBY, Sverre H. Zranitelný kód. Brno: Computer Press, 2006, 207 s. ISBN 80-251-1180-6.
THE OWASP FOUNDATION. OWASP [online]. 2014 [cit. 2014-02-26]. Dostupné z: https://www.owasp.org/index.php/Main_Page

**Course language:**
slovak

**Notes:**

| **Course assessment**<br>Total number of assessed students: 200 | | | | | |
|---|---|---|---|---|---|
| A | B | C | D | E | FX |
| 9.5 | 8.5 | 9.5 | 9.0 | 22.5 | 41.0 |
| **Provides:** doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD. | | | | | |
| **Date of last modification:** 27.03.2020 | | | | | |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. | | | | | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ ePAZ1a/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 ECTS credits:** 8

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 46

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 13.04 | 15.22 | 10.87 | 19.57 | 4.35 | 36.96 |

**Provides:** RNDr. Peter Gurský, PhD., RNDr. František Galčík, PhD., RNDr. Zuzana Bednárová, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ePAZ1b/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 ECTS credits:** 7

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

**Course level:** I.

**Prerequisities:** ÚINF/ePAZ1a/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 9.68 | 12.9 | 3.23 | 12.9 | 9.68 | 51.61 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc., RNDr. František Galčík, PhD., RNDr. Juraj Šebej, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PAZ1c/15 | **Course name:** Programming, algorithms, and complexity |
|---|---|

**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 ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
Gain skills to design and implement complex application with three-layer architecture and well-known design patterns.

**Brief outline of the course:**
1. Food vending machine as an example of small project. Class identification. Use-cases. Method and instance variable identification. Unit testing in JUnit.
2. Designing CRUD application. Quote Database application example. Entity identification and design. Entity identity. Designing interfaces for Data Access Objects and demo implementation. Three-layered architecture.
3. Bussiness logics in classes. Designing a simple layered application. Class relationships with static association. Pros and cons in hardwired associations.
4. Implementing Factory design pattern as an abstraction of hardwired association. Examples and usage of factory. Briefly about MVC design pattern. Models and view in Swing. Model examples: static, dynamic, refreshing model.
5. Interface as a contract between client and class. Contract in code: input and output parameters, exceptions. Preconditions, postconditions, invariants. Favouring interface over implementation. Inheritance vs composition dilemma. Pros and cons of inheritance, choosing a suitable inheritance candidate. Favouring composition over inheritance.
6. Encapsulation: definition and real use. Best practices for enforcing encapsulation. More about pros and cons of inheritance with examples. Liskov Substitution principle. Delegation as a hybrid between inheritance and composition.
7. Associations between classes. Cardinalities: 1:1, 1:M, 1:N. Design and realization in the code.
8. Exceptions: designing exceptions, exceptions classes and best practices. Three types of exception handling. Logging with default tools and with `slf4j` library. Logging best practices.
9. Service classes: two design approaches. Configuration vs input parameters.
10. Database access with Spring JDBC Template. Mapping objects and relationships.

**Recommended literature:**
SIERRA, K., BATES, B.: Head First Java (2nd Edition), 2005
ECKEL, B.: Thinking in Java (4th Edition), 2006

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 282

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 35.11 | 19.5 | 15.96 | 13.83 | 10.64 | 4.96 |

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

**Date of last modification:** 19.01.2017

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PRO1a/15 | **Course name:** Project I. |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 80

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 72.5 | 6.25 | 10.0 | 10.0 | 0.0 | 1.25 |

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

**Date of last modification:** 29.03.2019

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PRO1b/15 | **Course name:** Project II. |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 5., 7.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 60

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 65.0 | 11.67 | 10.0 | 3.33 | 3.33 | 6.67 |

**Provides:** Mgr. Alexander Szabari, PhD., RNDr. Róbert Novotný, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ PMdi/15 | **Course name:** Project management |
|---|---|

**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 ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 70.0 | 10.0 | 20.0 | 0.0 | 0.0 | 0.0 |

**Provides:** Mgr. Alexander Szabari, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚGE/ DPZ/13 | **Course name:** Remote sensing |
| **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 ECTS credits:** 3 | |
| **Recommended semester/trimester of the course:** 6. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:**<br>ŽELEZNÝ, M. (2012): Dálkový průzkum Země (skriptá), Západočeská univerzita v Plzni, Katedra kybernetiky. 93 s. URL: http://www.kky.zcu.cz/uploads/courses/dpz/DPZ-prednasky.pdf<br>CANADIAN CENTRE FOR REMOTE SENSING (2012): Fundamentals of Remoste Sensing (učebný text v angličtine, in English), 256 s. URL: http://www.nrcan.gc.ca/earth-sciences/geography-boundary/remote-sensing/fundamentals/1430.<br>BITTERER, L. (2005): Fotogrametria. Interné učebné texty z geodézie, fotogrametrie, katastrálneho mapovania. URL: http://svf.uniza.sk/kgd/literatura.html<br>HALOUNOVÁ L., PAVELKA K. (2005): Dálkový průzkum Země. Skriptá, ČVUT Praha, ISBN 80-01-03124-1. 192 s.<br>ŽÍHLAVNÍK, Š., SCHEER, Ľ., 2001: Diaľkový prieskum Zeme v lesníctve. TU Zvolen, 289 s.<br>KOLÁŘ J., HALOUNOVÁ L., Pavelka K. (1997): Dálkový průzkum Země. Skriptá, ČVUT Praha, 164 s.<br>DOBROVOLNÝ, P. (1998). Dálkový průzkum Země. Digitální zpracování obrazu. Masarykova Univerzita, Brno.<br>LILLESAND, T.M., KIEFER, R.W., CHIPMAN, J.W. (2015). Remote Sensing and Image Interpretation. 7. Vydanie, New York, USA (Wiley),756 s.<br>JENSEN, R. J. (2006): Remote Sensing: An Earth Resource Perspective. 2. vydanie, New Jersey, USA (Prentice Hall), 608 s.<br>CAMPBELL, J.B., WYNNE, R.H. (2011). Introduction to Remote Sensing. New York, USA (Guilford), 667 s. | |
| **Course language:** | |
| **Notes:** | |

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

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

**Provides:** doc. Mgr. Michal Gallay, PhD.

**Date of last modification:** 16.09.2017

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/APSP/16 | **Course name:** SAP Applications in Public Administration / a Company |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I., N

**Prerequisities:** ÚINF/ZSSP/16

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Description of the processes and procedures in the area of SAP budgeting, financing and asset management, SAP for human resources and payroll, SAP Administrative Office system, outputs - reporting in the SAP environment, output options, training outputs, output processing, and exporting data further processing in the environment of Excel, Word ..., inputs - import data in the SAP environment, preparation of input data, the procedure for importing data.

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 149

| abs | n | neabs |
|---|---|---|
| 95.97 | 0.0 | 4.03 |

**Provides:** Ing. Katarína Ninášová, RNDr. Edita Vojtová, Ing. Slávka Šimková, PhD.

**Date of last modification:** 05.06.2016

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/TMS/10 | **Course name:** Secrets of microworld |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 4., 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
term project

**Learning outcomes:**
To give a review of the recent results form the elementary particle physics for non-physicists layman level.

**Brief outline of the course:**
Introduction to the topics. Atom, nucleus and the basic forces in Nature. Quarks and classification of elementary particles. Methods and approaches in micro objects research. Contenporary experiments un subnuclear physics - BNL, CERN, JINR Dubna.

**Recommended literature:**
1.Frank Close: The cosmic onion, Heinemann Educational Books Ltd, 1990
2. Ljubimov A., Kiss D.: Vvedenie v experimentaľnuju fiziku častic, Dubna, 1999
3. J.Žáček: Úvod do fyziky elementárních částic, Karolinum, Praha, 2005
4. R. Mackintosh et al. : Jádro - cesta do srdce hmoty, Academia, Praha, 2003

**Course language:**
slovak

**Notes:**

**Course assessment**
Total number of assessed students: 67

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 73.13 | 16.42 | 10.45 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Jozef Urbán, CSc., prof. RNDr. Stanislav Vokál, DrSc., doc. RNDr. Janka Vrláková, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 7.

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 82

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 64.63 | 20.73 | 12.2 | 1.22 | 1.22 | 0.0 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/SPG1/15 | **Course name:** Seminar on computer graphics |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 6.

**Course level:** I.

**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:**

**Notes:**

**Course assessment**
Total number of assessed students: 37

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 72.97 | 13.51 | 8.11 | 2.7 | 0.0 | 2.7 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PRIS/15 | **Course name:** Software and information system |
|---|---|

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** ÚINF/ASU1/15 and ÚINF/TVP1/15 and ÚINF/PMO1/15 and ÚINF/SWI1b/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30.0 | 15.0 | 45.0 | 0.0 | 10.0 | 0.0 |

**Provides:**

**Date of last modification:** 21.08.2018

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/SWI1a/15 | **Course name:** Software engineering |
|---|---|

**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 ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:** ÚINF/DBS1a/15 or ÚINF/DBdi/15

**Conditions for course completion:**

**Learning outcomes:**
To provide information concerning the principal activities related to the development of software products.

**Brief outline of the course:**
System, subsystem, software system. Software processes. Introduction to project management. Requirements gathering. Software modelilng. Software architectures. Software development methodologies. Verification and validation. Resource management.

**Recommended literature:**
1. BERKUN, S. The Art Of Project Management. O Reilly, 2005.
2. BJORNER, D. Software engineering 1,2,3. Springer-Verlag Berlin, 2006.
3. SOMMERVILLE, I. Software Engineering. Addison-Wesley, 2007.

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 279

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 16.49 | 20.43 | 20.07 | 19.35 | 22.22 | 1.43 |

**Provides:** prof. RNDr. Gabriel Semanišin, PhD., Mgr. Alexander Szabari, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/SWI1b/15 | **Course name:** Software engineering |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 5.

**Course level:** I.

**Prerequisities:** ÚINF/SWI1a/15

**Conditions for course completion:**

**Learning outcomes:**
To learn principles and to developed fundamental skills concerning software modelling, development and implementation.

**Brief outline of the course:**
Software modelling in UML - the syntax and the semantics of UML diagrams. Foundation of Model Driven Architecture. Selected aspects of project management. Selected legal aspects of SW engineering. Pattern design.

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 236

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 47.03 | 16.53 | 12.29 | 8.47 | 14.41 | 1.27 |

**Provides:** Mgr. Alexander Szabari, PhD., prof. RNDr. Gabriel Semanišin, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/BZP1a/15 | **Course name:** Special seminar to bachelor thesis |
|---|---|

**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 ECTS credits:** 2

**Recommended semester/trimester of the course:** 7.

**Course level:** I.

**Prerequisities:** ÚINF/PBS/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 113

| abs | n |
|---|---|
| 95.58 | 4.42 |

**Provides:** RNDr. František Galčík, PhD., RNDr. Ľubomír Antoni, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 09.01.2019

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/BZP1b/15 | **Course name:** Special seminar to bachelor thesis |
|---|---|

**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 ECTS credits:** 2

**Recommended semester/trimester of the course:** 8.

**Course level:** I.

**Prerequisities:** ÚINF/BZP1a/15

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**
1. KATUŠČÁK, D.: Ako písať vysokoškolské a kvalifikačné práce, 2. vydanie Bratislava, 1998
2. ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure.
3. ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents. 4. Special and research literature connected to Bachalor theses according to recommendations of supervisor.

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 98

| abs | n |
|---|---|
| 98.98 | 1.02 |

**Provides:** RNDr. Ľubomír Antoni, PhD., RNDr. Ondrej Krídlo, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ MSU/07 | **Course name:** Statistical Methods of Data Analysis |
|---|---|

**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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 5.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Exam

**Learning outcomes:**
Introduction to probability theory and mathematical statistics.

**Brief outline of the course:**
General introduction to theory of probability, random processes and mathematical statistics.

**Recommended literature:**
1) L. Lyons, Statistics for Nuclear and Particle Physics, CUP, 1989.
2) L. Lyons, A Practical Guide to Data Analysis for Physical Science Students, CUP, 1991.
3) J.R. Taylor, An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements, University Science Books, 1997.

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 17.57 | 10.81 | 5.41 | 6.76 | 59.46 | 0.0 |

**Provides:** doc. RNDr. Jozef Urbán, CSc., doc. RNDr. Adela Kravčáková, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SXM1/15 | **Course name:** Structure formats and representation of data |
|---|---|

**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 ECTS credits:** 2

**Recommended semester/trimester of the course:** 5.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Evaluation of partial assignments within larger project.
Evaluation of multiple assignments corresponding to learning blocks.

**Learning outcomes:**
Become acknowledged with theoretical concepts and methodologies with structured and semistructured data. Acquire programming skills with implementations of these concepts.

**Brief outline of the course:**
Representation of semi-structured data in XML, valid and well-formed XML document. XML parsers: DOM, SAX, StAX. Java API of XML parsers. Schemas for XML documents: DTD, XML Schema. Addressing in XML: XPath. Transformations of XML documents: XSLT. Other formats for semistructured data: JSON, YAML. API for data binding in Java: Jackson (JSON), SnakeYAML (YAML), JAXB (XML).

**Recommended literature:**
1. Eliotte "Rusty" Harold. XML Bible, Gold Edition. Wiley, 2001. ISBN 978-0764548192.
2. Grigoris Antoniou, Frank Van Harmelen. A Semantic Web Primer, Second Edition. MIT Press, 2008. ISBN 978-0262012423.
3. Michaek Kay. XSLT 2.0 Programmer's Reference, 3rd Edition. Wrox, 2004. ISBN: 978-076456909.

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 31.03 | 25.86 | 18.97 | 12.07 | 12.07 | 0.0 |

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

**Date of last modification:** 01.06.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## 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 ECTS credits:** 4

**Recommended semester/trimester of the course:** 8.

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 171

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

**Provides:**

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/SPR1a/15 | **Course name:** System programming |
|---|---|

**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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 8.

**Course level:** I.

**Prerequisities:** ÚINF/JAC1/15

**Conditions for course completion:**
Implementation of final project and its oral defense.

**Learning outcomes:**
Provide and demonstrate basic concepts of Linux and Android system programming.

**Brief outline of the course:**
Programming language C.

**Recommended literature:**
1. Mark L. Mitchell, Alex Samuel, Jeffrey Oldham: Advanced Linux Programming. Sams, 2001. ISBN: 978-0735710436.
2. Mark L. Murphy: The Busy Coder's Guide to Android Development. CommonsWare, LLC, 2009. ISBN: 978-0981678009
3. W. Frank Ableson, Robi Sen, Chris King and C. Enrique Ortiz: Android in Action Third Edition. Manning, 2011. ISBN 9781617290503

**Course language:**
English

**Notes:**

**Course assessment**
Total number of assessed students: 164

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 43.29 | 17.07 | 10.98 | 6.1 | 11.59 | 10.98 |

**Provides:** doc. Ing. Štefánia Gallová, CSc., RNDr. PhDr. Peter Pisarčík

**Date of last modification:** 02.07.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ TVP1/15 | **Course name:** Testing and verification of programs |

**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 ECTS credits:** 5

**Recommended semester/trimester of the course:** 6.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
Verification of programs.
Introduction to a proving of program correctness. McCarthy function 91, a proof of a developed program correctness, basic definitions of partial and total program correctness. Mathematical background for a proving of program correctness. Predicate calculus, a repetition of a basic knowledge. Syntax, semantics, valid well-formed formulas, natural deduction, the resolution method.
Floyd method for a proving of program correctness. Flowchart programs, a proof of a partial correctness, a proof of a program termination.
Hoare method for a proving of program correctness. Programming language J0, axioms and the verification rules of Hoare axiomatic system, a partial and total correctness of programs, a program termination. Examples of proofs the partial and total correctness of programs.
*******
Testing of programs.
SELENIUM IDE plugin to Firefox. Installation of the plugin. The sequence of steps by the first test. Automated start of prepared test. Possibilities of test corrections.
The class DefaultSelenium and its methods by test writing. Survey of the best methods in the class DefaultSelenium. Implementation of methods for tests writing.
Selenium server. Installation Selenium Sever. Communication with selenium server.
Loading tests. Causes of using loading tests. Jmeter as a one of possible loading tests.
Test Case. Input data for a program testing prepared according to a flowchart program.
SOnar. Survey of written code, mapping of duplicated procedures, misused procedures. Survey Junit Tests.

**Recommended literature:**
1. Frade, M. J., and Pinto, J. S.: Verification Conditions for Source-level Imperative Programs. Techn. Report DI-CCTC-08-01, 2008, Computer Science and Technology Center, Braga – Portugal
2. Manna, Z. and Pnueli, A.: Temporal Verification of Reactive Systems: Progress. Draft, 1996

3. Almeida, J, B., Frade, M. J., Pinto, J. S. and Melo de Sousa, S.: Rigorous Software Development: An Introduction to Program Verification, Springer Verlag, 2011.
4. Manna, Z.: Mathematical Theory of Computation, McGraw-Hill, 1974, Slovak translation: SNTL, Praha, 1981.

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 41

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 19.51 | 26.83 | 24.39 | 12.2 | 17.07 | 0.0 |

**Provides:** doc. RNDr. Gabriela Andrejková, CSc., Mgr. Alexander Szabari, PhD.

**Date of last modification:** 18.10.2016

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/TYS1/15 | **Course name:** Typographical 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 ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To provide the basic information on principles for typesetting of documents containing mathematical formulas in Plain TeX, AMS-TeX, and LaTeX.

**Brief outline of the course:**
Typesetting of a plain text, special text symbols, using of text fonts. TeX macros. Enumerations in text and footnote command. Parameter setting determining the appearance of the pages. Typesetting of mathematical formulas in text and displays, aligning formulas. Definitions of TeX macros. Making tables and pictures. Definitions, theorems, and proofs in a mathematical document. Contents, bibliography, sections in a document.

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 246

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 47.97 | 18.29 | 19.51 | 6.5 | 6.91 | 0.81 |

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

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ ePOS2a/15 | **Course name:** User environments of operating systems |
| **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 ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 1. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Test - solving practical tasks.<br>final test | |
| **Learning outcomes:**<br>To be familiar in user interfaces of operation systems Windows and Linux, to know their options, advantages, disadvantages and differences.<br>To know, how to configure basic parameters, to install basic system software and to use internal and external devices. | |
| **Brief outline of the course:**<br>OS Windows - user accounts management, sharing, mounting remote directories. Processes, monitoring and modification of system parameters. Connecting to the Internet, settings and monitoring, firewall.<br>Basic features of FAT a NTFS file systems. Disk management, backups, recovery. File and directory permissions. Making links to files and directories. Virtualization and emulation of OS.<br>OS GNU/Linux, directories structure, shell. Running jobs, scheduling, jobs on background. Managing with files and directories, backups, file permissions, user groups. Connecting to the Internet. Firewall. Programs installation, Package managers, actualization. Backups on local and remote storage. Imaging. RAID field Management. | |
| **Recommended literature:**<br>1. O. Bitto: Microsoft Windows 7, Podrobná užívatelská příručka, Computer Press, 2011.<br>2. P. Broža, J. Hlavenka, J. Bednařík: Microsoft Windows XP (Užívateľská príručka), Computer Press, 2006.<br>3. S. Shah, W. Soyinka: Administrace systému Linux, Grada, 2007.<br>4. Linux - Dokumentační projekt, Computer Press, 2007. | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 15

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 80.0 | 0.0 | 6.67 | 0.0 | 6.67 | 6.67 |

**Provides:** RNDr. JUDr. Pavol Sokol, PhD.

**Date of last modification:** 03.05.2015

**Approved:** prof. RNDr. Gabriel Semanišin, PhD.

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/WBdi/15 | **Course name:** Web and a development of user environment |
|---|---|

**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 ECTS credits:** 3

**Recommended semester/trimester of the course:** 3., 5.

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Solving partial assignments and active participation in discussions in a virtual classroom. The course is realized in distance form.

**Learning outcomes:**
Create accessible and usable Web Sites, used the standards (X) HTML and CSS.
Apply the rules for the page layout.
Maintain website and use the basic procedures for their promotion.

**Brief outline of the course:**
Web Development using (X) HTML and CSS. Tools for web development. Standards of accessibility and usability of the web sites. Cycle of development web site and its promotion.

**Recommended literature:**
Basic sources for distance courses will be published in LMS Moodle.
TITTEL, Ed a Jeff NOBLE. HTML, XHTML & CSS. 7th ed. Hoboken, NJ: Wiley, c2011, xx, 392 p. --For dummies. ISBN 04-709-1659-1.
KRUG, Steve. Nenuťte uživatele přemýšlet!: praktický průvodce testováním a opravou chyb použitelnost webu. Vyd. 1. Brno: Computer Press, 2010, 165 s. ISBN 978-80-251-2923-4.
Slovensko. Výnos Ministerstva financií Slovenskej republiky z 9. júna 2010 o štandardoch pre informačné systémy verejnej správy. In: 312/2010. 2010. Dostupné z: http://informatizacia.sk/ext_dok-vynos_a_prilohy_2010-312/7431c

**Course language:**
slovak

**Notes:**

**Course assessment**
Total number of assessed students: 95

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 13.68 | 10.53 | 9.47 | 18.95 | 24.21 | 23.16 |

**Provides:** doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD.

| |
|---|
| **Date of last modification:** 27.03.2020 |
| **Approved:** prof. RNDr. Gabriel Semanišin, PhD. |