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## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                      |      |      |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                      |      |      |       |
| <b>Course ID:</b> CJP/<br>PFAJAKA/07                                                                                                                                                                                                                                                                                                                                                                                                                   |      | <b>Course name:</b> Academic English |      |      |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> combined, present                                                                                                                                                                                                                                      |      |                                      |      |      |       |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                       |      |                                      |      |      |       |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                      |      |      |       |
| <b>Course level:</b> I., II., N                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                      |      |      |       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                      |      |      |       |
| <b>Conditions for course completion:</b><br>Active classroom participation, 2 absences tolerated (4x45 min.) tolerated. 2 tests (5th/6th week and 12th/13th week), no retake. Minipresentation on chosen topic. Final evaluation- average assessment of tests and presentation. Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less                                                                                      |      |                                      |      |      |       |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                      |      |      |       |
| <b>Brief outline of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                      |      |      |       |
| <b>Recommended literature:</b><br>Seal B.: Academic Encounters, CUP, 2002<br>T. Armer :Cambridge English for Scientists, CUP 2011<br>M. McCarthy M., O'Dell F. - Academic Vocabulary in Use, CUP 2008<br>Zemach, D.E, Rumisek, L.A: Academic Writing, Macmillan 2005<br>Olsen, A. : Active Vocabulary, Pearson, 2013<br><a href="http://www.bbclearningenglish.com">www.bbclearningenglish.com</a><br>Cambridge Academic Content Dictionary, CUP, 2009 |      |                                      |      |      |       |
| <b>Course language:</b><br>English language, level B2 according to CEFR.                                                                                                                                                                                                                                                                                                                                                                               |      |                                      |      |      |       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                      |      |      |       |
| <b>Course assessment</b><br>Total number of assessed students: 355                                                                                                                                                                                                                                                                                                                                                                                     |      |                                      |      |      |       |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B    | C                                    | D    | E    | FX    |
| 31.55                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 23.1 | 15.77                                | 10.7 | 7.04 | 11.83 |
| <b>Provides:</b> PaedDr. Gabriela Bednáriková                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                      |      |      |       |
| <b>Date of last modification:</b> 04.10.2019                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                      |      |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                |      |                                      |      |      |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                                                  |       |      |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                  |       |      |       |
| <b>Course ID:</b> ÚMV/<br>ALG3b/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     | <b>Course name:</b> Algebra II for informaticians and physicists |       |      |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                            |     |                                                                  |       |      |       |
| <b>Number of ECTS credits:</b> 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                  |       |      |       |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                                                  |       |      |       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                  |       |      |       |
| <b>Prerequisites:</b> ÚMV/ALGa/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                  |       |      |       |
| <b>Conditions for course completion:</b><br>Exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                  |       |      |       |
| <b>Learning outcomes:</b><br>To provide deeper knowledge on vector spaces, linear transformations and Euclidean spaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                  |       |      |       |
| <b>Brief outline of the course:</b><br>Vector spaces, subspaces. A basis, a dimension and a characterization of n-dimensional vector spaces. The rank of a matrix. Linear transformations and their matrices. Operations with linear transformations, matrices of sums and compositions of linear transformations. Regular linear transformations, regular matrices. Similar matrices. Characteristic vectors and characteristic values of linear transformations.<br>Affine spaces, subspaces and their positions. Euclidean spaces, the distance of subspaces. Conics and quadrics. |     |                                                                  |       |      |       |
| <b>Recommended literature:</b><br>A. F. Beardon: Algebra and Geometry, Cambridge University Press, 2005<br>G. Birkhoff, S. Mac Lane: A Survey of Modern Algebra, New York 1965                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                                                  |       |      |       |
| <b>Course language:</b><br>Slovak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                  |       |      |       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |                                                                  |       |      |       |
| <b>Course assessment</b><br>Total number of assessed students: 351                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                  |       |      |       |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | B   | C                                                                | D     | E    | FX    |
| 11.68                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 9.4 | 9.97                                                             | 14.81 | 39.6 | 14.53 |
| <b>Provides:</b> doc. RNDr. Roman Soták, PhD., RNDr. Mária Maceková, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                  |       |      |       |
| <b>Date of last modification:</b> 26.03.2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |                                                                  |       |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                  |       |      |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                      |     |                                                    |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                         |     |                                                    |      |      |     |
| <b>Course ID:</b> ÚINF/<br>ASU1/15                                                                                                                                                                                         |     | <b>Course name:</b> Algorithms and data structures |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present |     |                                                    |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                           |     |                                                    |      |      |     |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                    |     |                                                    |      |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                    |     |                                                    |      |      |     |
| <b>Prerequisites:</b> (ÚINF/PAZ1a/15 or ÚINF/ePAZ1a/15) and (ÚINF/PAZ1b/15 or ÚINF/ePAZ1b/15)                                                                                                                              |     |                                                    |      |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                                                                   |     |                                                    |      |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                  |     |                                                    |      |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                                                        |     |                                                    |      |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                                             |     |                                                    |      |      |     |
| <b>Course language:</b>                                                                                                                                                                                                    |     |                                                    |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                              |     |                                                    |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 125                                                                                                                                                         |     |                                                    |      |      |     |
| A                                                                                                                                                                                                                          | B   | C                                                  | D    | E    | FX  |
| 12.8                                                                                                                                                                                                                       | 6.4 | 17.6                                               | 23.2 | 36.8 | 3.2 |
| <b>Provides:</b> RNDr. Rastislav Krivoš-Belluš, PhD.                                                                                                                                                                       |     |                                                    |      |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                               |     |                                                    |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                    |     |                                                    |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                           |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                           |      |      |      |
| <b>Course ID:</b> KPE/<br>ALP/06                                                                                                                                                                        |       | <b>Course name:</b> Alternative Education |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                           |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                           |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                 |       |                                           |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                           |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                           |      |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                           |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                           |      |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                           |      |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                           |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                           |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                           |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 208                                                                                                                                      |       |                                           |      |      |      |
| A                                                                                                                                                                                                       | B     | C                                         | D    | E    | FX   |
| 64.9                                                                                                                                                                                                    | 30.77 | 1.44                                      | 0.96 | 0.48 | 1.44 |
| <b>Provides:</b> PaedDr. Renáta Orosová, PhD., Mgr. Katarína Petříková, PhD.                                                                                                                            |       |                                           |      |      |      |
| <b>Date of last modification:</b> 25.03.2020                                                                                                                                                            |       |                                           |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                           |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                          |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                          |       |      |     |
| <b>Course ID:</b> ÚCHV/<br>ANCHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       | <b>Course name:</b> Analytical Chemistry |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                   |       |                                          |       |      |     |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                          |       |      |     |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                          |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                          |       |      |     |
| <b>Prerequisites:</b> ÚCHV/VCHU/14 or ÚCHV/VCHU/15 or ÚCHV/VCHU/10 or ÚCHV/VACH/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                          |       |      |     |
| <b>Conditions for course completion:</b><br>3x test of analytical calculations.<br>Examination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                          |       |      |     |
| <b>Learning outcomes:</b><br>Survey of basic principles and tasks of analytical chemistry and applications of analytical methods in research and practice.                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                          |       |      |     |
| <b>Brief outline of the course:</b><br>Subject and role of analytical chemistry. General principles and procedures - sampling, sample pre-treatment. Preparation of solutions. Evaluation of the results.<br>Classification of analytical reactions. Qualitative analysis of cations and anions. Basic principles of organic analysis.<br>Methods of quantitative analysis. General principles of gravimetry. Volumetric analysis.<br>Instrumental methods of analytical chemistry (basic principles, instrumentation and applications) - electroanalytical, optical and separation methods. |       |                                          |       |      |     |
| <b>Recommended literature:</b><br>Skoog D.A.: Principles of Instrumental Analysis. Saunders Col. Publishing, New York 1985.<br>D.Harvey: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.                                                                                                                                                                                                                                                                                                                                                                                             |       |                                          |       |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                          |       |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                          |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 666                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                          |       |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | B     | C                                        | D     | E    | FX  |
| 18.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 19.37 | 24.92                                    | 23.72 | 9.46 | 4.2 |
| <b>Provides:</b> doc. RNDr. Taťána Gondová, CSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                          |       |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                          |       |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                          |       |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                 |       |                                                        |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                    |       |                                                        |       |       |      |
| <b>Course ID:</b> ÚINF/<br>APS1/15                                                                                                                                                                                                                                                                                                                    |       | <b>Course name:</b> Applied probability and statistics |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                            |       |                                                        |       |       |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                      |       |                                                        |       |       |      |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                  |       |                                                        |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                               |       |                                                        |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                 |       |                                                        |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                              |       |                                                        |       |       |      |
| <b>Learning outcomes:</b><br>Acquired basic concepts and techniques of probability theory, statistics and corresponding software.                                                                                                                                                                                                                     |       |                                                        |       |       |      |
| <b>Brief outline of the course:</b><br>Events, probability. Laws of probability distributions, characteristics of location, variability and dependency. Samples, estimates and tests of hypotheses. Modeling of dependencies, noise and smoothing. Bayes theory of decision. Pseudorandom values and Monte Carlo method.                              |       |                                                        |       |       |      |
| <b>Recommended literature:</b><br>- Cs. Török: Úvod do teórie pravdepodobnosti a matematickej štatistiky, Košice, 1992<br>- M.R.Spiegel, J.J.Schiller, R.A.Srinivasan, Probability and Statistics, McGraw Hill, 2009<br>- J. Maindonald, W.J. Braun, Data Analysis and Graphics Using R – an Example-Based Approach, CAMBRIDGE UNIVERSITY PRESS, 2010 |       |                                                        |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                               |       |                                                        |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                         |       |                                                        |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 61                                                                                                                                                                                                                                                                                     |       |                                                        |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                                     | B     | C                                                      | D     | E     | FX   |
| 14.75                                                                                                                                                                                                                                                                                                                                                 | 19.67 | 22.95                                                  | 11.48 | 29.51 | 1.64 |
| <b>Provides:</b> doc. RNDr. Csaba Török, CSc.                                                                                                                                                                                                                                                                                                         |       |                                                        |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                          |       |                                                        |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                               |       |                                                        |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                      |      |                                                   |       |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                   |       |      |      |
| <b>Course ID:</b> ÚINF/<br>AFJ1a/15                                                                                                                                                                                                                                                                                                                                                                                        |      | <b>Course name:</b> Automata and formal languages |       |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                 |      |                                                   |       |      |      |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                           |      |                                                   |       |      |      |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                    |      |                                                   |       |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                   |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                   |       |      |      |
| <b>Conditions for course completion:</b><br>Oral examination.                                                                                                                                                                                                                                                                                                                                                              |      |                                                   |       |      |      |
| <b>Learning outcomes:</b><br>To provide theoretical background for studying computer science in general, by giving the necessary knowledge in theory of automata.                                                                                                                                                                                                                                                          |      |                                                   |       |      |      |
| <b>Brief outline of the course:</b><br>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. |      |                                                   |       |      |      |
| <b>Recommended literature:</b><br>J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2001.<br>J. Shallit: A second course in formal languages and automata theory, Cambridge University press, 2009.<br>M. Sipser: Introduction to the theory of computation, Thomson Course Technology, 2006.                                                            |      |                                                   |       |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                   |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                   |       |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 821                                                                                                                                                                                                                                                                                                                                                         |      |                                                   |       |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                          | B    | C                                                 | D     | E    | FX   |
| 25.33                                                                                                                                                                                                                                                                                                                                                                                                                      | 17.9 | 23.87                                             | 18.03 | 9.74 | 5.12 |
| <b>Provides:</b> Mgr. Alexander Szabari, PhD., prof. RNDr. Viliam Geffert, DrSc.                                                                                                                                                                                                                                                                                                                                           |      |                                                   |       |      |      |
| <b>Date of last modification:</b> 24.08.2018                                                                                                                                                                                                                                                                                                                                                                               |      |                                                   |       |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                    |      |                                                   |       |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                 |       |                                                   |       |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                   |       |      |      |
| <b>Course ID:</b> ÚINF/AFJ1b/15                                                                                                                                                                                                                                                                                                                                                                                       |       | <b>Course name:</b> Automata and formal languages |       |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                            |       |                                                   |       |      |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                   |       |      |      |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                  |       |                                                   |       |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                   |       |      |      |
| <b>Prerequisites:</b> ÚINF/AFJ1a/15                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                   |       |      |      |
| <b>Conditions for course completion:</b><br>Test and oral examination.                                                                                                                                                                                                                                                                                                                                                |       |                                                   |       |      |      |
| <b>Learning outcomes:</b><br>To provide theoretical background for studying computer science in general, by giving the necessary knowledge in theory of automata.                                                                                                                                                                                                                                                     |       |                                                   |       |      |      |
| <b>Brief outline of the course:</b><br>Chomsky and Greibach normal forms of context free gramars. Pushdown automata. Pumping lemma. Closure properties of context free and deterministic context free languages. Context sensitive grammars and linearly-bounded Turing machines. Phrase-structure grammars and Turing machines. Post correspondence problem. Undecidable problems in the theory of formal languages. |       |                                                   |       |      |      |
| <b>Recommended literature:</b><br>J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2001.<br>J. Shallit: A second course in formal languages and automata theory, Cambridge University press, 2009.<br>M. Sipser: Introduction to the theory of computation, Thomson Course Technology, 2006.                                                       |       |                                                   |       |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                   |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                   |       |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 550                                                                                                                                                                                                                                                                                                                                                    |       |                                                   |       |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                     | B     | C                                                 | D     | E    | FX   |
| 38.36                                                                                                                                                                                                                                                                                                                                                                                                                 | 15.45 | 19.64                                             | 17.64 | 6.18 | 2.73 |
| <b>Provides:</b> prof. RNDr. Viliam Geffert, DrSc., Mgr. Alexander Szabari, PhD., RNDr. Zuzana Bednárová, PhD.                                                                                                                                                                                                                                                                                                        |       |                                                   |       |      |      |
| <b>Date of last modification:</b> 01.06.2015                                                                                                                                                                                                                                                                                                                                                                          |       |                                                   |       |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                               |       |                                                   |       |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |                                      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |                                      |
| <b>Course ID:</b> ÚINF/<br>BKP/14                                                                                                                                                  | <b>Course name:</b> Bachelor Project |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |                                      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                   |                                      |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                            |                                      |
| <b>Course level:</b> I.                                                                                                                                                            |                                      |
| <b>Prerequisites:</b>                                                                                                                                                              |                                      |
| <b>Conditions for course completion:</b>                                                                                                                                           |                                      |
| <b>Learning outcomes:</b>                                                                                                                                                          |                                      |
| <b>Brief outline of the course:</b>                                                                                                                                                |                                      |
| <b>Recommended literature:</b>                                                                                                                                                     |                                      |
| <b>Course language:</b>                                                                                                                                                            |                                      |
| <b>Notes:</b>                                                                                                                                                                      |                                      |
| <b>Course assessment</b><br>Total number of assessed students: 2                                                                                                                   |                                      |
| abs                                                                                                                                                                                | n                                    |
| 100.0                                                                                                                                                                              | 0.0                                  |
| <b>Provides:</b>                                                                                                                                                                   |                                      |
| <b>Date of last modification:</b>                                                                                                                                                  |                                      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                            |                                      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |                                      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |                                      |
| <b>Course ID:</b> ÚCHV/<br>BKP/14                                                                                                                                                  | <b>Course name:</b> Bachelor Project |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |                                      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                   |                                      |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                            |                                      |
| <b>Course level:</b> I.                                                                                                                                                            |                                      |
| <b>Prerequisites:</b>                                                                                                                                                              |                                      |
| <b>Conditions for course completion:</b><br>Submission of the bachelor project, the defense of the project and acceptance of its content by the supervisor.                        |                                      |
| <b>Learning outcomes:</b>                                                                                                                                                          |                                      |
| <b>Brief outline of the course:</b>                                                                                                                                                |                                      |
| <b>Recommended literature:</b><br>1. Scientific papers related to the topic of the bachelor project.<br>2. Directive No. 1/2011 of the rector UPJS in Košice.                      |                                      |
| <b>Course language:</b>                                                                                                                                                            |                                      |
| <b>Notes:</b>                                                                                                                                                                      |                                      |
| <b>Course assessment</b><br>Total number of assessed students: 52                                                                                                                  |                                      |
| abs                                                                                                                                                                                | n                                    |
| 100.0                                                                                                                                                                              | 0.0                                  |
| <b>Provides:</b>                                                                                                                                                                   |                                      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                       |                                      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                            |                                      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |      |                                                     |      |     |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |      |                                                     |      |     |     |
| <b>Course ID:</b> ÚCHV/<br>BPO/14                                                                                                                                                  |      | <b>Course name:</b> Bachelor Thesis and its Defence |      |     |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |      |                                                     |      |     |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                   |      |                                                     |      |     |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                               |      |                                                     |      |     |     |
| <b>Course level:</b> I.                                                                                                                                                            |      |                                                     |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                              |      |                                                     |      |     |     |
| <b>Conditions for course completion:</b>                                                                                                                                           |      |                                                     |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                          |      |                                                     |      |     |     |
| <b>Brief outline of the course:</b><br>Oral presentation of the thesis results. Answering questions of the thesis oponent or members of the state examination board.               |      |                                                     |      |     |     |
| <b>Recommended literature:</b>                                                                                                                                                     |      |                                                     |      |     |     |
| <b>Course language:</b><br>slovak                                                                                                                                                  |      |                                                     |      |     |     |
| <b>Notes:</b>                                                                                                                                                                      |      |                                                     |      |     |     |
| <b>Course assessment</b><br>Total number of assessed students: 154                                                                                                                 |      |                                                     |      |     |     |
| A                                                                                                                                                                                  | B    | C                                                   | D    | E   | FX  |
| 87.01                                                                                                                                                                              | 9.09 | 1.95                                                | 1.95 | 0.0 | 0.0 |
| <b>Provides:</b>                                                                                                                                                                   |      |                                                     |      |     |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                       |      |                                                     |      |     |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                            |      |                                                     |      |     |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |       |                                                     |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |       |                                                     |      |      |     |
| <b>Course ID:</b> ÚINF/<br>BPO/14                                                                                                                                                  |       | <b>Course name:</b> Bachelor Thesis and its Defence |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |       |                                                     |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                   |       |                                                     |      |      |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                               |       |                                                     |      |      |     |
| <b>Course level:</b> I.                                                                                                                                                            |       |                                                     |      |      |     |
| <b>Prerequisites:</b>                                                                                                                                                              |       |                                                     |      |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                           |       |                                                     |      |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                          |       |                                                     |      |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                |       |                                                     |      |      |     |
| <b>Recommended literature:</b>                                                                                                                                                     |       |                                                     |      |      |     |
| <b>Course language:</b>                                                                                                                                                            |       |                                                     |      |      |     |
| <b>Notes:</b>                                                                                                                                                                      |       |                                                     |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 81                                                                                                                  |       |                                                     |      |      |     |
| A                                                                                                                                                                                  | B     | C                                                   | D    | E    | FX  |
| 45.68                                                                                                                                                                              | 24.69 | 16.05                                               | 8.64 | 4.94 | 0.0 |
| <b>Provides:</b>                                                                                                                                                                   |       |                                                     |      |      |     |
| <b>Date of last modification:</b> 09.01.2019                                                                                                                                       |       |                                                     |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                            |       |                                                     |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                         |      |     |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |                                         |      |     |      |
| <b>Course ID:</b> ÚCHV/<br>MIN1/14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      | <b>Course name:</b> Basis of Mineralogy |      |     |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                         |      |                                         |      |     |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                         |      |     |      |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                         |      |     |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                         |      |     |      |
| <b>Prerequisites:</b> ÚCHV/VCH/10 or ÚCHV/VCHU/10 or ÚCHV/ZAC2/10 or ÚCHV/VACH/10 or ÚCHV/CHG/09 or ÚCHV/ZCF/03 or ÚCHV/VCHU/15                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                         |      |     |      |
| <b>Conditions for course completion:</b><br>Verification of theoretical knowledge and recognizing minerals.<br>Semester project, practical test from recognizing of minerals, optional oral examination.                                                                                                                                                                                                                                                                                                                                                                           |      |                                         |      |     |      |
| <b>Learning outcomes:</b><br>To recognize the beauty of nature and to obtain basic knowledge from mineralogy. To familiarize students with properties of usual minerals and to recognize these minerals.                                                                                                                                                                                                                                                                                                                                                                           |      |                                         |      |     |      |
| <b>Brief outline of the course:</b><br>Basic terms and definitions, origin of minerals in nature. Basis of morphological and structural crystallography: characteristic properties of crystals, crystallographic laws, crystal structure, unit cells and their parameters, crystallographic systems with examples of minerals. Crystallochemistry: types of bonds and structures and their effect on the properties of minerals. Physical properties of minerals and their utilize in minerals classification. Basis of genetic and systematic mineralogy. Structure of silicates. |      |                                         |      |     |      |
| <b>Recommended literature:</b><br>M. Košuth: Mineralógia. Elfa, s.r.o. Košice, 2001<br>V. Radzo: Mineralógia, Alfa Bratislava, 1987.                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                         |      |     |      |
| <b>Course language:</b><br>Slovak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                         |      |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                         |      |     |      |
| <b>Course assessment</b><br>Total number of assessed students: 85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                         |      |     |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | B    | C                                       | D    | E   | FX   |
| 88.24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 8.24 | 1.18                                    | 1.18 | 0.0 | 1.18 |
| <b>Provides:</b> doc. RNDr. Ivan Potočný, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                         |      |     |      |
| <b>Date of last modification:</b> 27.03.2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |                                         |      |     |      |

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |
| <b>Course ID:</b> ÚCHV/<br>BCHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Course name:</b> Biochemistry |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 <b>Per study period:</b> 42<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                  |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |
| <b>Prerequisites:</b> ÚCHV/VCHU/10 or ÚCHV/VCHU/15 or ÚCHV/VACH/10 or ÚCHV/VCHU/14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |
| <b>Conditions for course completion:</b><br>test + oral examination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |
| <b>Learning outcomes:</b><br>The aim of biochemistry teaching is to acquire knowledge in the field of living organisms on the basis of their molecular structure and metabolism.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
| <b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Protein Structure and Function, Exploring proteins</li> <li>2. DNA and RNA and the Flow of Genetic Information, Exploring genes</li> <li>3. Enzymes: Basic Concepts and Kinetics, Catalytic Strategies and Regulatory Strategies</li> <li>4. Carbohydrates (Monosaccharides, Disaccharides, Polysaccharides – Functions and Properties)</li> <li>5. Lipids and Cells Membranes, Membrane Channels and Pumps</li> <li>6. Metabolis: Basic Concepts and Design, Signal-Transduction Pathways</li> <li>7. Glycolysis and Gluconeogenesis, Glycogen Metabolism</li> <li>8. The Citric Acid Cycle and Glyoxylate Cycle</li> <li>9. Oxidative Phosphorylation, The Light Reactions of Photosynthesis</li> <li>10. The Calvin Cycle and the Pentose Phosphate Pathway</li> <li>11. Fatty Acids Metabolism, Urea Cycle</li> <li>12. DNA Replication, Transcription (RNA Synthesis)</li> <li>13. Protein Synthesis &amp; Degradation, the Integration of Metabolism</li> </ol> |                                  |
| <b>Recommended literature:</b><br>Škárka: Biochémia. Alfa, 1992<br>Voet a Voetová: Biochemie. Victoria Publishing, Praha, 1994<br>Stryer, L.: Biochemistry, W.H. Freeman and Company, New York, 1988                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                  |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |

|                                                                                         |       |       |       |       |      |
|-----------------------------------------------------------------------------------------|-------|-------|-------|-------|------|
| <b>Course assessment</b>                                                                |       |       |       |       |      |
| Total number of assessed students: 1169                                                 |       |       |       |       |      |
| A                                                                                       | B     | C     | D     | E     | FX   |
| 18.73                                                                                   | 17.28 | 20.96 | 21.04 | 19.25 | 2.74 |
| <b>Provides:</b> doc. RNDr. Erik Sedlák, PhD., RNDr. Nataša Tomášková, PhD.             |       |       |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                            |       |       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |       |       |       |      |

## COURSE INFORMATION LETTER

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------|------|------|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                            |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                            |      |      |     |
| <b>Course ID:</b> ÚCHV/<br>PBCHU/15                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       | <b>Course name:</b> Biochemistry Practical |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 <b>Per study period:</b> 56<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                    |       |                                            |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                            |      |      |     |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |      |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |      |      |     |
| <b>Prerequisites:</b> ÚCHV/BCHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                            |      |      |     |
| <b>Conditions for course completion:</b><br>Protocols + 75 % continuous evaluation.                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                            |      |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                            |      |      |     |
| <b>Brief outline of the course:</b><br>The most important biochemical laboratory methods. The qualitative tests for amino acids and proteins. Time-dependent course of enzyme-catalyzed reaction: determination of enzymatic activity, determination of the first order rate constant, calculations of math models (examples), effect of a substrate concentration on initial rate of reaction, determination of $K_m$ and $V_{max}$ for urease. Isolation and detection of nucleic acids. |       |                                            |      |      |     |
| <b>Recommended literature:</b><br><a href="http://kosice.upjs.sk/~kbch/">http://kosice.upjs.sk/~kbch/</a>                                                                                                                                                                                                                                                                                                                                                                                  |       |                                            |      |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                            |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 132                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                            |      |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | B     | C                                          | D    | E    | FX  |
| 74.24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20.45 | 3.79                                       | 0.76 | 0.76 | 0.0 |
| <b>Provides:</b> doc. RNDr. Mária Kožurková, CSc., RNDr. Nataša Tomášková, PhD., RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., RNDr. Eva Konkoľová, PhD.                                                                                                                                                                                                                                                                                                                      |       |                                            |      |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                            |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |      |      |     |

## COURSE INFORMATION LETTER

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------|------|------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                              |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                              |      |      |      |
| <b>Course ID:</b> ÚCHV/<br>BAC1/04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       | <b>Course name:</b> Bioinorganic Chemistry I |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                       |       |                                              |      |      |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                              |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                              |      |      |      |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                              |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                              |      |      |      |
| <b>Conditions for course completion:</b><br>Test or seminar works<br>examination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                              |      |      |      |
| <b>Learning outcomes:</b><br>The basic knowledges about biometal interactions with biomolecules, biomaterials, biominerals, biocatalysis, metals in biology and medicine, metal-based drugs, toxic metals for biosystems and metals in the environment.                                                                                                                                                                                                                                                                                                                                                          |       |                                              |      |      |      |
| <b>Brief outline of the course:</b><br>Metalic and non-metalic elements and their roles in biological systems (biometals, bulk biological elements, essential trace elements). Biocoordination compounds, bioligands. Biocatalyzers. Oxygen carriers and oxygen transport proteins. Photochemical process. Catalysis and regulation processes. Calcium biominerals and biomineralization. Toxic metals. Application of knowledge of bioinorganic chemistry in pharmacy, chemotherapy (e.g. platinum complexes in cancer therapy) radiodiagnostics, mineral biotechnology, ecology and in other branches of life. |       |                                              |      |      |      |
| <b>Recommended literature:</b><br>1. Shriver D. F., Atkins P. W., Overton T. L., Rourke J.P., Weller M.T., Amstrong F.A.: Shiver & Atkins. Inorganic Chemistry. Oxford University Press, Oxford 2006.<br>2. Kaim W., Schwederski B.: Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life. Wiley, Chichester 1998.<br>3. Wilkins P. C., Wilkins R. G.: Inorganic Chemistry in Biology. OCP, Oxford 1997.                                                                                                                                                                                          |       |                                              |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                              |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                              |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 272                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                              |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | B     | C                                            | D    | E    | FX   |
| 41.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 27.57 | 19.12                                        | 5.15 | 6.25 | 0.37 |
| <b>Provides:</b> doc. RNDr. Zuzana Vargová, Ph.D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                              |      |      |      |

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|-----------------------------------------------------------------------------------------|
| <b>Date of last modification:</b> 03.05.2015                                            |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                   |       |                                                         |       |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                      |       |                                                         |       |      |      |
| <b>Course ID:</b> ÚBEV/<br>BDD/05                                                                                                                                                                                                                                                                                                                       |       | <b>Course name:</b> Biology of Children and Adolescents |       |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 0 <b>Per study period:</b> 28 / 0<br><b>Course method:</b> present                                                                                                                               |       |                                                         |       |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                        |       |                                                         |       |      |      |
| <b>Recommended semester/trimester of the course:</b> 4., 6.                                                                                                                                                                                                                                                                                             |       |                                                         |       |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                 |       |                                                         |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                   |       |                                                         |       |      |      |
| <b>Conditions for course completion:</b><br>Written test                                                                                                                                                                                                                                                                                                |       |                                                         |       |      |      |
| <b>Learning outcomes:</b><br>The aim of the subject is to gain the particular level of knowledge about human body and its development. It is necessary for the understanding of specific biological characteristics of children and adolescents linked to development.                                                                                  |       |                                                         |       |      |      |
| <b>Brief outline of the course:</b><br>Human ontogenesis. Postnatal development. Age specific features of skeletal and muscular, circulatory, respiratory, gastrointestinal and urinary systems. Reproductive system. Endocrine system. Nervous system. Age specifics of selected diseases and drug dependence arise. Human population and environment. |       |                                                         |       |      |      |
| <b>Recommended literature:</b><br>Drobný I., Drobná M.: Biológia dieťaťa pre špeciálnych pedagógov I. a II. Bratislava, PdF UK, 2000<br>Lipková V.: Somatický a fyziologický vývoj dieťaťa. Osveta Bratislava, 1980<br>Malá H., Klementa J.: Biológia detí a dorastu. Bratislava, SPN, 1989                                                             |       |                                                         |       |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                 |       |                                                         |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                           |       |                                                         |       |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 1470                                                                                                                                                                                                                                                                                     |       |                                                         |       |      |      |
| A                                                                                                                                                                                                                                                                                                                                                       | B     | C                                                       | D     | E    | FX   |
| 31.56                                                                                                                                                                                                                                                                                                                                                   | 23.33 | 17.41                                                   | 17.55 | 9.59 | 0.54 |
| <b>Provides:</b> doc. RNDr. Monika Kassayová, CSc.                                                                                                                                                                                                                                                                                                      |       |                                                         |       |      |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                            |       |                                                         |       |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                 |       |                                                         |       |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                           |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                           |       |       |      |
| <b>Course ID:</b> ÚCHV/<br>CHV1/99                                                                                                                                                                                                                                                                                                                                                                                                                       |       | <b>Course name:</b> Chemical calculations |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                  |       |                                           |       |       |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                           |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                           |       |       |      |
| <b>Conditions for course completion:</b><br>Short written tests.<br>Written test.                                                                                                                                                                                                                                                                                                                                                                        |       |                                           |       |       |      |
| <b>Learning outcomes:</b><br>To teach students how to calculate material balances in the systems with or without chemical processes and how to calculate examples concerning the chemical equilibrium.                                                                                                                                                                                                                                                   |       |                                           |       |       |      |
| <b>Brief outline of the course:</b><br>Expression of the clear matter amount and the system composition. Stoichiometric formula. Material balances for preparation, dissolving and mixing of solutions, and for separating of mixtures. Material balances for combined processes. Chemical equations and material balances in the systems with chemical processes. Acid-Base equilibrium and the pH calculations. The solubility product and solubility. |       |                                           |       |       |      |
| <b>Recommended literature:</b><br>Potočník I.: Chemické výpočty vo všeobecnej a anorganickej chémii (skriptum), PF UPJŠ, Košice, 2006.                                                                                                                                                                                                                                                                                                                   |       |                                           |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                           |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 1357                                                                                                                                                                                                                                                                                                                                                                                      |       |                                           |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                        | B     | C                                         | D     | E     | FX   |
| 21.52                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 19.45 | 24.17                                     | 20.56 | 13.49 | 0.81 |
| <b>Provides:</b> RNDr. Martin Vavra, PhD., doc. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslav Almáši, PhD.                                                                                                                                                                                                                                                                                                                                                 |       |                                           |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                           |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                               |      |                                       |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                  |      |                                       |      |      |      |
| <b>Course ID:</b> ÚCHV/ISC1a/00                                                                                                                                                                                                                                                                                                                     |      | <b>Course name:</b> Cheminformatics I |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                             |      |                                       |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                    |      |                                       |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                             |      |                                       |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                             |      |                                       |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                               |      |                                       |      |      |      |
| <b>Conditions for course completion:</b><br>seminar exercises, seminar project                                                                                                                                                                                                                                                                      |      |                                       |      |      |      |
| <b>Learning outcomes:</b><br>Introductory course aimed at introducing students to the fundamental informatics techniques for chemistry-related disciplines. The class will cover a wide range of topics, including searching chemical information on internet, searching for patent information and work with the primary and secondary literature. |      |                                       |      |      |      |
| <b>Brief outline of the course:</b><br>Searching, retrieving and use of the informations in chemistry. Using of "paper" resources (primary journals, Chemical Abstracts, Beilstein). Searching chemical information on Internet (Scirus, ScienceDirect, Scopus, Web of Science, Medline, NIST) and e-journals.                                      |      |                                       |      |      |      |
| <b>Recommended literature:</b><br>1. R.E. Maizell: How to find Chemical Information, John Wiley, New York 1998<br>2. Internet resources for chemistry.                                                                                                                                                                                              |      |                                       |      |      |      |
| <b>Course language:</b><br>slovak language and english language                                                                                                                                                                                                                                                                                     |      |                                       |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                       |      |                                       |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 836                                                                                                                                                                                                                                                                                  |      |                                       |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                   | B    | C                                     | D    | E    | FX   |
| 70.22                                                                                                                                                                                                                                                                                                                                               | 8.25 | 12.44                                 | 6.82 | 1.56 | 0.72 |
| <b>Provides:</b> RNDr. Monika Tvrdoňová, PhD., RNDr. Ladislav Janovec, PhD.                                                                                                                                                                                                                                                                         |      |                                       |      |      |      |
| <b>Date of last modification:</b> 05.02.2020                                                                                                                                                                                                                                                                                                        |      |                                       |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                             |      |                                       |      |      |      |

## COURSE INFORMATION LETTER

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------|-------|------|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |       |                               |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |       |                               |       |      |     |
| <b>Course ID:</b> ÚCHV/<br>SCHM/14                                                                                                                                                 |       | <b>Course name:</b> Chemistry |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |       |                               |       |      |     |
| <b>Number of ECTS credits:</b> 1                                                                                                                                                   |       |                               |       |      |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                               |       |                               |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                            |       |                               |       |      |     |
| <b>Prerequisites:</b> (ÚCHV/VCHU/10 or ÚCHV/VCHU/14 or ÚCHV/VCHU/15) and ÚCHV/ACHU/03 and ÚCHV/BCHU/03 and ÚCHV/FCHU/10 and ÚCHV/ANCHU/03 and ÚCHV/OCHU/03                         |       |                               |       |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                           |       |                               |       |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                          |       |                               |       |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                |       |                               |       |      |     |
| <b>Recommended literature:</b>                                                                                                                                                     |       |                               |       |      |     |
| <b>Course language:</b>                                                                                                                                                            |       |                               |       |      |     |
| <b>Notes:</b>                                                                                                                                                                      |       |                               |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 86                                                                                                                  |       |                               |       |      |     |
| A                                                                                                                                                                                  | B     | C                             | D     | E    | FX  |
| 23.26                                                                                                                                                                              | 38.37 | 22.09                         | 10.47 | 5.81 | 0.0 |
| <b>Provides:</b>                                                                                                                                                                   |       |                               |       |      |     |
| <b>Date of last modification:</b> 30.05.2016                                                                                                                                       |       |                               |       |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                            |       |                               |       |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                  |                                                                |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                     |                                                                |
| <b>Course ID:</b> KOP/OPaPDV/14                                                                                                                                                                        | <b>Course name:</b> Civil Law and Intellectual Property Rights |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |                                                                |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                       |                                                                |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                                            |                                                                |
| <b>Course level:</b> I., N                                                                                                                                                                             |                                                                |
| <b>Prerequisites:</b>                                                                                                                                                                                  |                                                                |
| <b>Conditions for course completion:</b>                                                                                                                                                               |                                                                |
| <b>Learning outcomes:</b>                                                                                                                                                                              |                                                                |
| <b>Brief outline of the course:</b>                                                                                                                                                                    |                                                                |
| <b>Recommended literature:</b>                                                                                                                                                                         |                                                                |
| <b>Course language:</b>                                                                                                                                                                                |                                                                |
| <b>Notes:</b>                                                                                                                                                                                          |                                                                |
| <b>Course assessment</b><br>Total number of assessed students: 81                                                                                                                                      |                                                                |
| abs                                                                                                                                                                                                    | n                                                              |
| 93.83                                                                                                                                                                                                  | 6.17                                                           |
| <b>Provides:</b> doc. JUDr. Renáta Bačárová, PhD., LL.M., prof. JUDr. Peter Vojčík, CSc.                                                                                                               |                                                                |
| <b>Date of last modification:</b> 10.09.2018                                                                                                                                                           |                                                                |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                |                                                                |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                         |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                         |
| <b>Course ID:</b> CJP/<br>PFAJKKA/07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Course name:</b> Communicative Competence in English |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> combined, present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                         |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |
| <b>Course level:</b> I., II., N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                         |
| <b>Conditions for course completion:</b><br>Active participation in class and completed homework assignments. Students are allowed to miss two classes at the most.<br>2 credit tests (presumably in weeks 6/7 and 12/13) and short academic presentations in English on selected topics.<br>Final grade will be calculated as follows: A 93-100 %, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64 % and less.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                         |
| <b>Learning outcomes:</b><br>Uplatnenie a aktívne používanie svojich teoretických vedomostí v praktických komunikačných situáciách. Zdokonalenie jazykových vedomostí a zručností študenta, rečovej, pragmatickej a vecnej kompetencie, predovšetkým zlepšujú komunikáciu, schopnosť prijímať a formulovať výpovede, efektívne vyjadrovať svoje myšlienky ako aj orientovať sa v obsahovom pláne výpovede. Precvičovanie rečových intencií kontaktných (napr. pozdravy, oslovenia, pozvanie, oslovenie), informatívnych (napr. získavanie a podávanie informácií, vyjadrenie priestorových a časových vzťahov), regulačných (napr. prosba, poďakovanie, zákaz, pochvala, súhlas, nesúhlas) a hodnotiacich (napr. vyjadrenie vlastného názoru, stanoviska, želania, emócií). Výsledkom budovania praktickej jazykovej kompetencie majú byť vedomosti a zručnosti zodpovedajúce požiadavkám a kritériám dokumentu Spoločný európsky referenčný rámec pre vyučovanie jazykov. |                                                         |
| <b>Brief outline of the course:</b><br>Rodina, jej formy a problémy<br>Vyjadrovanie pocitov a dojmov<br>Dom, bývanie a budúcnosť<br>Formy a dialekty v anglickom jazyku<br>Život v meste a na vidieku<br>Kolokácie a idiomy, zaužívané slovné spojenia<br>Prázdniny a sviatky vo svete<br>Životné prostredie a ekológia<br>Výnimky zo slovosledu<br>Frázové slovesá a ich použitie<br>Charakteristiky neformálneho diškurzu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |

**Recommended literature:**

www.bbclearningenglish.com

McCarthy M., O'Dell F.: English Vocabulary in Use, Upper-Intermediate. CUP, 1994.

Misztal M.: Thematic Vocabulary. SPN, 1998.

Fictumova J., Ceccarelli J., Long T.: Angličtina, konverzace pro pokročilé. Barrister and Principal, 2008.

Peters S., Gráf T.: Time to practise. Polyglot, 2007.

Jones L.: Communicative Grammar Practice. CUP, 1985.

Alexander L.G.: Longman English Grammar. Longman, 1988.

**Course language:**

English language, B2 level according to CEFR

**Notes:****Course assessment**

Total number of assessed students: 237

| A    | B     | C     | D   | E    | FX   |
|------|-------|-------|-----|------|------|
| 38.4 | 22.36 | 19.41 | 9.7 | 6.75 | 3.38 |

**Provides:** Mgr. Barbara Mitříková

**Date of last modification:** 11.02.2020

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------|------|-------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                                                 |      |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                                                 |      |       |      |
| <b>Course ID:</b> KGER/NJKK/07                                                                                                                                                                          |       | <b>Course name:</b> Communicative Competence in German Language |      |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                                                 |      |       |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                                                 |      |       |      |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                    |       |                                                                 |      |       |      |
| <b>Course level:</b> I., II.                                                                                                                                                                            |       |                                                                 |      |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                                                 |      |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                                                 |      |       |      |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                                                 |      |       |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                                                 |      |       |      |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                                                 |      |       |      |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                                                 |      |       |      |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                                                 |      |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 44                                                                                                                                       |       |                                                                 |      |       |      |
| A                                                                                                                                                                                                       | B     | C                                                               | D    | E     | FX   |
| 59.09                                                                                                                                                                                                   | 13.64 | 6.82                                                            | 4.55 | 13.64 | 2.27 |
| <b>Provides:</b> Mgr. Eva Černáková, PhD.                                                                                                                                                               |       |                                                                 |      |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                            |       |                                                                 |      |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                                                 |      |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                            |       |                                                      |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                               |       |                                                      |      |      |      |
| <b>Course ID:</b> CJP/<br>PFAJGA/07                                                                                                                                                                                                                                                                                                                                                                              |       | <b>Course name:</b> Communicative Grammar in English |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> combined, present                                                                                                                                                                                                |       |                                                      |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                      |      |      |      |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                             |       |                                                      |      |      |      |
| <b>Course level:</b> I., II., N                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                      |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                      |      |      |      |
| <b>Conditions for course completion:</b><br>Active classroom participation (max. 2x90 min. absences tolerated). 2 test (5th/6th and 12/13th week), no retake. Final evaluation- average assessment of tests. Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less.                                                                                                                  |       |                                                      |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                      |      |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                                                                                                                                                                                                                              |       |                                                      |      |      |      |
| <b>Recommended literature:</b><br>Vince M.: Macmillan Grammar in Context, Macmillan, 2008<br>McCarthy, O'Dell: English Vocabulary in Use, CUP, 1994<br>C. Oxengen, C. Latham-Koenig: New English File Advanced, Oxford 2010<br>Misztal M.: Thematic Vocabulary, Fragment, 1998<br><a href="http://www.bbclearningenglish.com">www.bbclearningenglish.com</a><br><a href="http://ted.com/talks">ted.com/talks</a> |       |                                                      |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                      |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                      |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 406                                                                                                                                                                                                                                                                                                                                               |       |                                                      |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                | B     | C                                                    | D    | E    | FX   |
| 39.66                                                                                                                                                                                                                                                                                                                                                                                                            | 18.97 | 16.75                                                | 8.62 | 5.91 | 10.1 |
| <b>Provides:</b> PaedDr. Gabriela Bednáriková                                                                                                                                                                                                                                                                                                                                                                    |       |                                                      |      |      |      |
| <b>Date of last modification:</b> 14.09.2019                                                                                                                                                                                                                                                                                                                                                                     |       |                                                      |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                                                                                          |       |                                                      |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |      |                                                              |     |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |      |                                                              |     |      |     |
| <b>Course ID:</b> KGER/<br>NJKG/07                                                                                                                                                                      |      | <b>Course name:</b> Communicative Grammar in German Language |     |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |      |                                                              |     |      |     |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |      |                                                              |     |      |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                    |      |                                                              |     |      |     |
| <b>Course level:</b> I., II.                                                                                                                                                                            |      |                                                              |     |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                   |      |                                                              |     |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                                                |      |                                                              |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                               |      |                                                              |     |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |      |                                                              |     |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                          |      |                                                              |     |      |     |
| <b>Course language:</b>                                                                                                                                                                                 |      |                                                              |     |      |     |
| <b>Notes:</b>                                                                                                                                                                                           |      |                                                              |     |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 50                                                                                                                                       |      |                                                              |     |      |     |
| A                                                                                                                                                                                                       | B    | C                                                            | D   | E    | FX  |
| 56.0                                                                                                                                                                                                    | 12.0 | 10.0                                                         | 4.0 | 10.0 | 8.0 |
| <b>Provides:</b> PaedDr. Ingrid Puchalová, PhD.                                                                                                                                                         |      |                                                              |     |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                            |      |                                                              |     |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |      |                                                              |     |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                   |       |                                          |      |      |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                      |       |                                          |      |      |       |
| <b>Course ID:</b> ÚINF/<br>TVY/15                                                                                                                                                                                                                                                                                                                                                                       |       | <b>Course name:</b> Computability theory |      |      |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                              |       |                                          |      |      |       |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                        |       |                                          |      |      |       |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                                                                                                                                                 |       |                                          |      |      |       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                 |       |                                          |      |      |       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                   |       |                                          |      |      |       |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                |       |                                          |      |      |       |
| <b>Learning outcomes:</b><br>To provide theoretical background for studying computer science in general, by familiarising students with basic knowledge of the theory of computability.                                                                                                                                                                                                                 |       |                                          |      |      |       |
| <b>Brief outline of the course:</b><br>Turing machine as a formalisation of the notion of an algorithm. Partial recursive functions. Kleene's normal form theorem. The equivalences of the notion of a function calculable by a Turing machine, partial recursive and calculable by a computer program. Algorithmical undecidability of the halting problem of a Turing machine and a computer program. |       |                                          |      |      |       |
| <b>Recommended literature:</b><br>MACHTEY, M. and YOUNG, P.: An Introduction to the General Theory of Algorithms, North--Holland, Amsterdam 1978.<br>BRIDGES, D. S.: Computability, A Mathematical Sketch book, Springer--Verlag 1994                                                                                                                                                                   |       |                                          |      |      |       |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                 |       |                                          |      |      |       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                           |       |                                          |      |      |       |
| <b>Course assessment</b><br>Total number of assessed students: 262                                                                                                                                                                                                                                                                                                                                      |       |                                          |      |      |       |
| A                                                                                                                                                                                                                                                                                                                                                                                                       | B     | C                                        | D    | E    | FX    |
| 44.27                                                                                                                                                                                                                                                                                                                                                                                                   | 12.21 | 13.74                                    | 6.11 | 6.49 | 17.18 |
| <b>Provides:</b> doc. RNDr. Stanislav Krajčí, PhD.                                                                                                                                                                                                                                                                                                                                                      |       |                                          |      |      |       |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                            |       |                                          |      |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                 |       |                                          |      |      |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                               |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                               |
| <b>Course ID:</b> ÚINF/PSIN/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Course name:</b> Computer network Internet |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                               |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |
| <b>Prerequisites:</b> ÚINF/PAZ1a/15 or ÚINF/ePAZ1a/15 or ÚINF/PRG1/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                               |
| <b>Conditions for course completion:</b><br>Activity at exercises (max 18 points), home work (max 18 points), test (max 30 points).<br>Verbal exam (min 25 points, max 50 points). Required minimum for passing the course is 64 points.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |
| <b>Learning outcomes:</b><br>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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                               |
| <b>Brief outline of the course:</b><br>1. Introduction to computer networks, internet connection types, delay and loss in packet-switched networks, ISO OSI reference model and TCP/IP protocols family.<br>2. Application layer: Web and HTTP, protocol FTP ,e-mail and SMTP, POP3, IMAP,<br>3. Application layer: domain names and DNS, Peer-to-peer applications. Security in computer networks.<br>4. Transport layer: services, multiplexing and demultiplexing, protocol UDP, reliable data transfer<br>5. Transport layer: connection oriented transport protocol TCP, flow and congestion control.<br>6. Network Layer: Internet protocol IPv4, virtual circuit and datagram networks, packet fragmentation, routing table, application protocol DHCP<br>7. Network Layer: network address translation NAT, ICMP protocol, internet protocol IPv6<br>8. Network Layer: routing algorithms and protocols, broadcast and multicast routing<br>9. Link layer: error detection, multiple access methods CSMA/CD and CSMA/CA, Ethernet, frames, protocols ARP and RARP, link layer addressing<br>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<br>11. Physical Layer: Communication channels parameters, digital and analog encoding. |                                               |
| <b>Recommended literature:</b><br>1. J. F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach, 7. edition, 2016<br>2. A. S. Tanenbaum: Computer Networks, 5. edition, Pearson, 2010<br>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        |      |       |       |       |       |
| <b>Course language:</b>                                                                 |      |       |       |       |       |
| <b>Notes:</b>                                                                           |      |       |       |       |       |
| <b>Course assessment</b>                                                                |      |       |       |       |       |
| Total number of assessed students: 743                                                  |      |       |       |       |       |
| A                                                                                       | B    | C     | D     | E     | FX    |
| 9.69                                                                                    | 5.11 | 11.84 | 16.42 | 37.01 | 19.92 |
| <b>Provides:</b> RNDr. Peter Gurský, PhD.                                               |      |       |       |       |       |
| <b>Date of last modification:</b> 06.02.2019                                            |      |       |       |       |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |      |       |       |       |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                   |       |                                            |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                      |       |                                            |      |      |     |
| <b>Course ID:</b> ÚCHV/<br>KCHU/03                                                                                                                                                                                                                                      |       | <b>Course name:</b> Coordination Chemistry |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                              |       |                                            |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                        |       |                                            |      |      |     |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                 |       |                                            |      |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                 |       |                                            |      |      |     |
| <b>Prerequisites:</b> ÚCHV/ACHU/03                                                                                                                                                                                                                                      |       |                                            |      |      |     |
| <b>Conditions for course completion:</b><br>Final written exam                                                                                                                                                                                                          |       |                                            |      |      |     |
| <b>Learning outcomes:</b><br>The student acquires basic knowledge on the coordination compounds, preparation, isomerism and properties of coordination compounds as well as about the chemical bonding in coordination compounds.                                       |       |                                            |      |      |     |
| <b>Brief outline of the course:</b><br>Definition and nomenclature of coordination compounds. Central atom and ligands, coordination numbers. Isomerism, preparation and stability of coordination compounds, chemical bonding in coordination compounds.               |       |                                            |      |      |     |
| <b>Recommended literature:</b><br>J. Ribas: Coordination Chemistry, Wiley-VCH, Weinheim, 2008.<br>J. C. Huheey, E. A. Keiter, R. L. Keiter: Inorganic Chemistry, Haper Collins, New York, 1993.<br>G. A. Lawrance: Introduction to Coordination Chemistry, Wiley, 2010. |       |                                            |      |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                 |       |                                            |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                           |       |                                            |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 63                                                                                                                                                                                                       |       |                                            |      |      |     |
| A                                                                                                                                                                                                                                                                       | B     | C                                          | D    | E    | FX  |
| 55.56                                                                                                                                                                                                                                                                   | 22.22 | 15.87                                      | 3.17 | 3.17 | 0.0 |
| <b>Provides:</b> prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD.                                                                                                                                                                                         |       |                                            |      |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                            |       |                                            |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                 |       |                                            |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                      |      |                                                                  |       |       |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                         |      |                                                                  |       |       |       |
| <b>Course ID:</b> ÚINF/<br>KRS/15                                                                                                                                                                                          |      | <b>Course name:</b> Cryptographic systems and their applications |       |       |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28<br><b>Course method:</b> present |      |                                                                  |       |       |       |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                           |      |                                                                  |       |       |       |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                    |      |                                                                  |       |       |       |
| <b>Course level:</b> I., II.                                                                                                                                                                                               |      |                                                                  |       |       |       |
| <b>Prerequisites:</b>                                                                                                                                                                                                      |      |                                                                  |       |       |       |
| <b>Conditions for course completion:</b>                                                                                                                                                                                   |      |                                                                  |       |       |       |
| <b>Learning outcomes:</b>                                                                                                                                                                                                  |      |                                                                  |       |       |       |
| <b>Brief outline of the course:</b>                                                                                                                                                                                        |      |                                                                  |       |       |       |
| <b>Recommended literature:</b>                                                                                                                                                                                             |      |                                                                  |       |       |       |
| <b>Course language:</b>                                                                                                                                                                                                    |      |                                                                  |       |       |       |
| <b>Notes:</b>                                                                                                                                                                                                              |      |                                                                  |       |       |       |
| <b>Course assessment</b><br>Total number of assessed students: 106                                                                                                                                                         |      |                                                                  |       |       |       |
| A                                                                                                                                                                                                                          | B    | C                                                                | D     | E     | FX    |
| 13.21                                                                                                                                                                                                                      | 9.43 | 12.26                                                            | 12.26 | 33.96 | 18.87 |
| <b>Provides:</b> doc. RNDr. Stanislav Krajčí, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.                                                                                                                                    |      |                                                                  |       |       |       |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                               |      |                                                                  |       |       |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                    |      |                                                                  |       |       |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                               |      |                                      |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                  |      |                                      |       |       |      |
| <b>Course ID:</b> ÚINF/<br>DBS1a/15                                                                                                                                                                                                                                                                 |      | <b>Course name:</b> Database systems |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                          |      |                                      |       |       |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                    |      |                                      |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                             |      |                                      |       |       |      |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                        |      |                                      |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                               |      |                                      |       |       |      |
| <b>Conditions for course completion:</b><br>Tests, assignments.                                                                                                                                                                                                                                     |      |                                      |       |       |      |
| <b>Learning outcomes:</b><br>Acquired basic concepts and techniques of relational database theory and a corresponding software.                                                                                                                                                                     |      |                                      |       |       |      |
| <b>Brief outline of the course:</b><br>Relational DB, SQL, Filtration, Grouping and Aggregation, Join, Three-Value Logic.<br>Data and database models, database design, integrity, ER diagrams.<br>DWH data warehouses, data cubes, pivot. Data science. Normalization 1.                           |      |                                      |       |       |      |
| <b>Recommended literature:</b><br>- J. ULLMAN: Principles of database and knowledge – base systems, Comp. Sci. Press., 1988<br>- R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw-Hill, 2003<br>- HENDERSON, K.: The Guru's Guide to Transact SQL, Addison Wesley Professional, 2000 |      |                                      |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                             |      |                                      |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                       |      |                                      |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 829                                                                                                                                                                                                                                  |      |                                      |       |       |      |
| A                                                                                                                                                                                                                                                                                                   | B    | C                                    | D     | E     | FX   |
| 10.98                                                                                                                                                                                                                                                                                               | 9.17 | 17.73                                | 22.56 | 32.45 | 7.12 |
| <b>Provides:</b> doc. RNDr. Csaba Török, CSc.                                                                                                                                                                                                                                                       |      |                                      |       |       |      |
| <b>Date of last modification:</b> 26.02.2020                                                                                                                                                                                                                                                        |      |                                      |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                             |      |                                      |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                 |     |                                      |       |       |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                    |     |                                      |       |       |       |
| <b>Course ID:</b> ÚINF/DBS1b/15                                                                                                                                                                                                                                                                                                                                                                       |     | <b>Course name:</b> Database systems |       |       |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                                                            |     |                                      |       |       |       |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                      |     |                                      |       |       |       |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                               |     |                                      |       |       |       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                               |     |                                      |       |       |       |
| <b>Prerequisites:</b> ÚINF/DBS1a/15 or ÚINF/DBdi/15                                                                                                                                                                                                                                                                                                                                                   |     |                                      |       |       |       |
| <b>Conditions for course completion:</b><br>Tests, assignments.                                                                                                                                                                                                                                                                                                                                       |     |                                      |       |       |       |
| <b>Learning outcomes:</b><br>Advanced techniques of relational databases and theoretical fundamentals of DB normalization and relational algebra. NoSQL                                                                                                                                                                                                                                               |     |                                      |       |       |       |
| <b>Brief outline of the course:</b><br>Stored procedures, functions. Triggers. Views. CTE, recursion and transitive closure.<br>Set operations. Window functions. Transactions. Cursors. B-trees and indexes. XML, JSON.<br>Relational algebra. Functional Dependencies and Essential Tuple NF.<br>Big Data and NoSQL, MongoDB, CRUD and Cursors, Aggregations and Indexes, Replication and Sharding. |     |                                      |       |       |       |
| <b>Recommended literature:</b><br>- K. Chodorow, MongoDB: The Definitive Guide, O'Reilly, second edition, 2013<br>- Date C.J., Database Design and Relational Theory, O'Reilly, 2012<br>- Itzik Ben-Gan, Microsoft SQL Server, 2012 T-SQL Fundamentals, O'Reilly, 2012<br>- L. Davidson, J.M. Moss, Pro SQL Server 2012 Relational database Design and Implementation, APRESS, 2012                   |     |                                      |       |       |       |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                               |     |                                      |       |       |       |
| <b>Notes:</b><br>If necessary, teaching, mid-term and final evaluation will be by distance form.                                                                                                                                                                                                                                                                                                      |     |                                      |       |       |       |
| <b>Course assessment</b><br>Total number of assessed students: 687                                                                                                                                                                                                                                                                                                                                    |     |                                      |       |       |       |
| A                                                                                                                                                                                                                                                                                                                                                                                                     | B   | C                                    | D     | E     | FX    |
| 10.33                                                                                                                                                                                                                                                                                                                                                                                                 | 8.3 | 11.5                                 | 23.44 | 35.81 | 10.63 |
| <b>Provides:</b> doc. RNDr. Csaba Török, CSc.                                                                                                                                                                                                                                                                                                                                                         |     |                                      |       |       |       |
| <b>Date of last modification:</b> 30.03.2020                                                                                                                                                                                                                                                                                                                                                          |     |                                      |       |       |       |

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                                                      |      |     |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                                                      |      |     |     |
| <b>Course ID:</b><br>KPPaPZ/PUDB/15                                                                                                                                                                     |       | <b>Course name:</b> Drug Addiction Prevention in University Students |      |     |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                                                      |      |     |     |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                                                      |      |     |     |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                                             |       |                                                                      |      |     |     |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                                                      |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                                                      |      |     |     |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                                                      |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                                                      |      |     |     |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                                                      |      |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                                                      |      |     |     |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                                                      |      |     |     |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                                                      |      |     |     |
| <b>Course assessment</b><br>Total number of assessed students: 318                                                                                                                                      |       |                                                                      |      |     |     |
| A                                                                                                                                                                                                       | B     | C                                                                    | D    | E   | FX  |
| 78.62                                                                                                                                                                                                   | 17.92 | 2.52                                                                 | 0.94 | 0.0 | 0.0 |
| <b>Provides:</b> Mgr. Marianna Berinšterová, PhD., prof. PhDr. Oľga Orosová, CSc.                                                                                                                       |       |                                                                      |      |     |     |
| <b>Date of last modification:</b> 06.09.2018                                                                                                                                                            |       |                                                                      |      |     |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                                                      |      |     |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |
| <b>Course ID:</b> ÚINF/EDS/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Course name:</b> Educational software |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 0 / 2 <b>Per study period:</b> 0 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |
| <b>Conditions for course completion:</b><br>1 Preparation of interim assignments:<br>a) Worksheet for student (with custom graphics)<br>b) Multimedia educational presentation (with pictures, animations and sounds)<br>c) Interactive educational quiz (with several types of quiz items)<br>d) Methodological guidance on the use of interactive applications in teaching selected topic of chosen school subject.<br>2 Creation and presentation of final project on the use of educational software in education.                                                                                                     |                                          |
| <b>Learning outcomes:</b><br>1. To acquire an overview of the educational software types and its exploitation in education.<br>2. To gain or enhance basic skills in working with:<br>a) presentation software, programs for creation and editing images, animations, diagrams, sounds, concept maps,<br>b) programs for creation of quizzes, questionnaires, voting,<br>c) simulation and modeling software,<br>d) selected subject-oriented educational programs,<br>3. To create and present a final project on the use of educational software in education.                                                           |                                          |
| <b>Brief outline of the course:</b><br>Educational software types. Onlilne educational sources and tools. Multimedia processing. Tools for creation of teaching aids.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |
| <b>Recommended literature:</b><br>1. Digitálna gramotnosť učiteľa : učebný materiál- modul 1 / Rastislav Adámek ... [et al.]. - Košice : Ústav informácií a prognóz školstva, 2009. - 80 s. - ISBN 9788080861193(brož.).<br>2. Moderná didaktická technika v práci učiteľa : učebný materiál modul 2 / Rastislav Adámek ... [et al.] ; recenzenti Viliam Fedák, Anton Lavrin. - Košice : Elfa, 2010. - 200 s. - ISBN 9788080861353 (brož.).<br>3. Web, Multimédia / Martin Homola ... [et al.]. - Bratislava : Štátny pedagogický ústav, 2010. - 68 s. - Č. projektu: ŠPVV ĎVUi 26120130001. - ISBN 9788081180514 (brož.). |                                          |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |

**Notes:**

Content of lessons will be flexibly adapted to the field of study of learners. Language learners will be able to work more with pictures and sounds, physicists with simulation programs, mathematicians with mathematical software, etc.

**Course assessment**

Total number of assessed students: 43

| A     | B     | C     | D   | E    | FX  |
|-------|-------|-------|-----|------|-----|
| 58.14 | 23.26 | 16.28 | 0.0 | 2.33 | 0.0 |

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

**Date of last modification:** 03.05.2015

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                         |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                         |
| <b>Course ID:</b> CJP/<br>PFAJ4/07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Course name:</b> English Language of Natural Science |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: 2 Per study period: 28</b><br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                         |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                         |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                         |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                         |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                         |
| <b>Conditions for course completion:</b><br>Active participation in class and completed homework assignments. Students are allowed to miss 2 classes at the most.<br>Continuous assessment: 2 credit tests (presumably in weeks 6 and 13) and academic presentation in English.<br>In order to be admitted to the final exam, a student has to score at least 65 % as a sum of both credit tests.<br>The exam test results represent 50% of the final grade for the course, continuous assessment results represent the other 50% of the final grade.<br>The final grade for the course will be calculated as follows:<br>A 93-100, B 86-92, C 79-85, D 72-78, E 65-71, FX 64 and less. |                                                         |
| <b>Learning outcomes:</b><br>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.                                                                                                                                                                    |                                                         |
| <b>Brief outline of the course:</b><br>ANGLICKÝ JAZYK PRE GEOGRAFOV:<br>Veda a výskum. Odbor geografia.<br>Planéta Zem. Naša slnečná sústava.<br>Zemetrasenia, Sopečná činnosť.<br>Svetové oceány a ľadovce.<br>Životné prostredie a geografia.<br>Počasie a klíma.<br>ANGLICKÝ JAZYK PRE EKOLÓGOV:<br>Veda a výskum. Odbor ekológia.<br>Životné prostredie. Znečistenie a dôsledky.<br>Sopečná činnosť, zemetrasenia.<br>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 nomenklatury.  
**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-intermediate, Intermediate. Cambridge University Press, 2003.  
 Armer, T.: Cambridge English for Scientists. CUP, 2011.

|                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |      |      |      |
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| Wharton J.: Academic Encounters. The Natural World. CUP, 2009.<br>Murphy, R.: English Grammar in Use. Cambridge University Press, 1994.<br>P. Fitzgerald : English for ICT studies. Garnet Publishing, 2011.<br><a href="https://worldservice/learningenglish">https://worldservice/learningenglish</a> , <a href="https://spectator.sme.sk">https://spectator.sme.sk</a><br><a href="http://www.isllibrary.com">www.isllibrary.com</a> |       |       |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                           |       |       |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 2582                                                                                                                                                                                                                                                                                                                                                                     |       |       |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                       | B     | C     | D    | E    | FX   |
| 36.91                                                                                                                                                                                                                                                                                                                                                                                                                                   | 25.17 | 17.04 | 10.3 | 8.37 | 2.21 |
| <b>Provides:</b> PaedDr. Gabriela Bednáríková, Mgr. Zuzana Naďová, Mgr. Oľga Lešková, PhDr. Marianna Škultétyová                                                                                                                                                                                                                                                                                                                        |       |       |      |      |      |
| <b>Date of last modification:</b> 08.02.2020                                                                                                                                                                                                                                                                                                                                                                                            |       |       |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                 |       |       |      |      |      |

## COURSE INFORMATION LETTER

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------|-----|------|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |      |                                               |     |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |      |                                               |     |      |     |
| <b>Course ID:</b> ÚINF/BSSMI/15                                                                                                                                                    |      | <b>Course name:</b> Essentials of Informatics |     |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |      |                                               |     |      |     |
| <b>Number of ECTS credits:</b> 1                                                                                                                                                   |      |                                               |     |      |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                               |      |                                               |     |      |     |
| <b>Course level:</b> I.                                                                                                                                                            |      |                                               |     |      |     |
| <b>Prerequisites:</b> ÚINF/PSIN/15 and ÚINF/PAZ1b/15 and ÚINF/OSY1/15 and ÚINF/AFJ1a/15 and ÚINF/SLO1a/15                                                                          |      |                                               |     |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                           |      |                                               |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                          |      |                                               |     |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                |      |                                               |     |      |     |
| <b>Recommended literature:</b>                                                                                                                                                     |      |                                               |     |      |     |
| <b>Course language:</b>                                                                                                                                                            |      |                                               |     |      |     |
| <b>Notes:</b>                                                                                                                                                                      |      |                                               |     |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 5                                                                                                                   |      |                                               |     |      |     |
| A                                                                                                                                                                                  | B    | C                                             | D   | E    | FX  |
| 20.0                                                                                                                                                                               | 20.0 | 0.0                                           | 0.0 | 60.0 | 0.0 |
| <b>Provides:</b>                                                                                                                                                                   |      |                                               |     |      |     |
| <b>Date of last modification:</b> 16.06.2017                                                                                                                                       |      |                                               |     |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                            |      |                                               |     |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                  |       |                                    |     |     |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                     |       |                                    |     |     |      |
| <b>Course ID:</b> ÚCHV/<br>PCH1/00                                                                                                                                                                                                                                                                                     |       | <b>Course name:</b> Food chemistry |     |     |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                             |       |                                    |     |     |      |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                       |       |                                    |     |     |      |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                                                                |       |                                    |     |     |      |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                           |       |                                    |     |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                  |       |                                    |     |     |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                               |       |                                    |     |     |      |
| <b>Learning outcomes:</b><br>Students will receive informations and knowledges about chemical substances in food, their importance and chemical changes in food during processing and storage.                                                                                                                         |       |                                    |     |     |      |
| <b>Brief outline of the course:</b><br>The main categories of substances in the most important group of food. Aminoacids, proteins, lipids, carbohydrates. Water, minerals, low concentration anorganic compounds, vitamins. Hydrocarbons, colorants, toxic compounds, aditives. Chemical reactions in dairy products. |       |                                    |     |     |      |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                         |       |                                    |     |     |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                |       |                                    |     |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                          |       |                                    |     |     |      |
| <b>Course assessment</b><br>Total number of assessed students: 256                                                                                                                                                                                                                                                     |       |                                    |     |     |      |
| A                                                                                                                                                                                                                                                                                                                      | B     | C                                  | D   | E   | FX   |
| 60.55                                                                                                                                                                                                                                                                                                                  | 33.98 | 5.08                               | 0.0 | 0.0 | 0.39 |
| <b>Provides:</b> RNDr. Ján Elečko, PhD.                                                                                                                                                                                                                                                                                |       |                                    |     |     |      |
| <b>Date of last modification:</b> 11.09.2017                                                                                                                                                                                                                                                                           |       |                                    |     |     |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                |       |                                    |     |     |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                             |     |     |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                             |     |     |      |
| <b>Course ID:</b> ÚCHV/<br>BACHZ/06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       | <b>Course name:</b> Fundamentals of Bioanalytical Chemistry |     |     |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                             |     |     |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                             |     |     |      |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                             |     |     |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                             |     |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                             |     |     |      |
| <b>Conditions for course completion:</b><br>written test<br>Oral examination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                             |     |     |      |
| <b>Learning outcomes:</b><br>Principles and theoretical foundations the application of analytical methods in bioanalysis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                             |     |     |      |
| <b>Brief outline of the course:</b><br>Introduction to Bioanalytical Chemistry. Biological samples classification. Factors that affect analytes in biological samples. Collection, transport and storage of samples, the main principles of sampling, the suppressing of undesirable phenomena. Selected methods of pretreatment of biological samples. Analyzers, equipment and organization of work in a clinical laboratory. Control and management of quality in clinical laboratory. Quality manual, calibration, control, and reference materials. Validation and Good Laboratory Practice. Buffers in bioanalysis. Enzymes in bioanalysis, introduction, distribution, Mechanism of enzyme catalysis. The kinetics of enzymatic reactions with one substrate, the Michaelis constant, constant specificity, lag phase, kinetics of reactions with two substrates. Moderators of enzyme activity. Selected methods for analysis of biomolecules. |       |                                                             |     |     |      |
| <b>Recommended literature:</b><br>1.Mikkelsen S.R, Cortón E.: Bioanalytical Chemistry, Wiley, 2004<br>2.Wilson I., Bioanalytical Separations 4, (Handbook of Analytical Separations), Elsevier, 2003<br>3.Lee, D.C., Webb, M. Pharmaceutical Analysis, Blackwell, 2003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                             |     |     |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                             |     |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                             |     |     |      |
| <b>Course assessment</b><br>Total number of assessed students: 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                             |     |     |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B     | C                                                           | D   | E   | FX   |
| 33.33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 30.86 | 30.86                                                       | 3.7 | 0.0 | 1.23 |
| <b>Provides:</b> doc. RNDr. Katarína Reiffová, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                             |     |     |      |

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|-----------------------------------------------------------------------------------------|
| <b>Date of last modification:</b> 03.05.2015                                            |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                       |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                       |       |      |     |
| <b>Course ID:</b> ÚCHV/<br>VCHU/15                                                                                                                                                                                                                                                                                                                                                                                                                                              |      | <b>Course name:</b> General Chemistry |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                      |      |                                       |       |      |     |
| <b>Number of ECTS credits:</b> 7                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                                       |       |      |     |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                       |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                       |       |      |     |
| <b>Prerequisites:</b> ÚCHV/CHV1/99                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                       |       |      |     |
| <b>Conditions for course completion:</b><br>Written test in the middle and the end of the semester.<br>Oral examination.                                                                                                                                                                                                                                                                                                                                                        |      |                                       |       |      |     |
| <b>Learning outcomes:</b><br>To provide students with knowledge of atoms and molecules their electronic structure, theories of chemical bonds, physical properties of elements and compounds.                                                                                                                                                                                                                                                                                   |      |                                       |       |      |     |
| <b>Brief outline of the course:</b><br>Main terms used in chemistry. Atoms – models of atoms, electron configuration, chemical periodicity and its effect on the properties of elements, radioactivity. Chemical bonds and intermolecular interactions. Chemical structure and physical properties of matter. State of matter. Solutions. Chemical equilibrium. Basis of chemical thermodynamics and chemical kinetics. Classification of chemical reactions. Electrochemistry. |      |                                       |       |      |     |
| <b>Recommended literature:</b><br>1. Atkins P., Jones L.: Chemical Principles, 2nd ed., Freeman, New York 2002.<br>2. Russel J.B.: General Chemistry, 2nd ed., McGraw Hill, London 1992.                                                                                                                                                                                                                                                                                        |      |                                       |       |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                       |       |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                       |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 204                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                       |       |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B    | C                                     | D     | E    | FX  |
| 20.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 25.0 | 34.31                                 | 13.24 | 7.35 | 0.0 |
| <b>Provides:</b> prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                       |       |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                       |       |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                         |      |                                       |       |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                         |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                                         |      |      |     |
| <b>Course ID:</b> ÚCHV/<br>PACU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                |       | <b>Course name:</b> General Course of Analytical Chemistry - Laboratory |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 <b>Per study period:</b> 56<br><b>Course method:</b> present                                                                                                                                                                                                                                                                           |       |                                                                         |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                         |      |      |     |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                         |      |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                         |      |      |     |
| <b>Prerequisites:</b> ÚCHV/ANCHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                         |      |      |     |
| <b>Conditions for course completion:</b><br>Assessment                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                                         |      |      |     |
| <b>Learning outcomes:</b><br>Application of theoretical knowledge to analytical laboratory practise                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                         |      |      |     |
| <b>Brief outline of the course:</b><br>Practical in qualitative and quantitative analysis. Qualitative analysis, separation by selective precipitation. Quantitative methods. Gravimetry, general principles of method. Volumetric methods. Preparation of accurate solutions. Indication of equivalency point. Titration curves, calculations in volumetric analysis. Acidimetry, alkalimetry. Manganometry. Iodometry. Complexometry. Selected Instrumental analytical methods. |       |                                                                         |      |      |     |
| <b>Recommended literature:</b><br>D.Harvey: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.<br>D.A.Skoog: Principles of Instrumental Analysis. Saunders Col. Publishing, New York 1985.<br>E.Prichard: Quality in the Analytical Chemistry Laboratory, Wiley, 1995                                                                                                                                                                                                        |       |                                                                         |      |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                         |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                         |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 317                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                                         |      |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | B     | C                                                                       | D    | E    | FX  |
| 57.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 28.39 | 11.36                                                                   | 1.26 | 1.58 | 0.0 |
| <b>Provides:</b> doc. Ing. Viera Vojteková, PhD., RNDr. Rastislav Serbin, PhD., RNDr. Lívia Kocúrová, PhD., RNDr. Jana Šandrejová, PhD.                                                                                                                                                                                                                                                                                                                                           |       |                                                                         |      |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                                         |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                         |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                      |      |                                                                    |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                         |      |                                                                    |      |      |      |
| <b>Course ID:</b> KFaDF/DF2p/03                                                                                                                                                                                            |      | <b>Course name:</b> History of Philosophy 2 (General Introduction) |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present |      |                                                                    |      |      |      |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                           |      |                                                                    |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                    |      |                                                                    |      |      |      |
| <b>Course level:</b> I., II.                                                                                                                                                                                               |      |                                                                    |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                      |      |                                                                    |      |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                   |      |                                                                    |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                  |      |                                                                    |      |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                                        |      |                                                                    |      |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                                             |      |                                                                    |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                    |      |                                                                    |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                              |      |                                                                    |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 739                                                                                                                                                         |      |                                                                    |      |      |      |
| A                                                                                                                                                                                                                          | B    | C                                                                  | D    | E    | FX   |
| 60.89                                                                                                                                                                                                                      | 13.8 | 12.58                                                              | 8.66 | 3.38 | 0.68 |
| <b>Provides:</b> doc. PhDr. Pavol Tholt, PhD., mim. prof., Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., doc. Mgr. Róbert Stojka, PhD.                                                                     |      |                                                                    |      |      |      |
| <b>Date of last modification:</b> 25.03.2020                                                                                                                                                                               |      |                                                                    |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                    |      |                                                                    |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                                |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                                |      |      |      |
| <b>Course ID:</b> ÚINF/<br>IKTP/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       | <b>Course name:</b> Information and Communication Technologies |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                                |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                                |      |      |      |
| <b>Conditions for course completion:</b><br>Problems solved during the semester. A final project using presentation programs, spreadsheet programs, text processors, internet resources and search tools. The ECDL certificate (all 7 modulus) is accepted as the exam with the ranking "A-výborne".                                                                                                                                                                                                                                                                                                       |       |                                                                |      |      |      |
| <b>Learning outcomes:</b><br>To achieve and extend fundamental information and communication knowledge to the level which is acceptable in the EU region.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                |      |      |      |
| <b>Brief outline of the course:</b><br>Text processing using a word processor.<br>Processing and evaluation of information using a spreadsheet.<br>Search, retrieval and exchange of information via the Internet.<br>Creating presentations.                                                                                                                                                                                                                                                                                                                                                              |       |                                                                |      |      |      |
| <b>Recommended literature:</b><br>1. Franců, M: Jak zvládnout testy ECDL. Praha : Computer Press, 2007. 160 s. ISBN 978-80-251-1485-8.<br>2. Jančařík, A. et al.: S počítačem do Evropy – ECDL. 2. vydanie. Praha : Computer Press, 2007. 152 s. ISBN 80-251-1844-3.<br>3. Kolektív autorov: Sylabus ECDL verzia 5.0. [on-line] [citované 9.2.2010]. Dostupné na internete: < <a href="http://www.ecdl.sk/buxus/docs//interne_informacie/Sylabus_V5.0/20090630ECDL-SylabusV50_SK-V01_FIN.pdf">http://www.ecdl.sk/buxus/docs//interne_informacie/Sylabus_V5.0/20090630ECDL-SylabusV50_SK-V01_FIN.pdf</a> >. |       |                                                                |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 1012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                                |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | B     | C                                                              | D    | E    | FX   |
| 65.91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 17.69 | 6.92                                                           | 3.46 | 1.68 | 4.35 |
| <b>Provides:</b> Mgr. Alexander Szabari, PhD., doc. RNDr. Ľubomír Šnajder, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                                |      |      |      |

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|-----------------------------------------------------------------------------------------|
| <b>Date of last modification:</b> 03.05.2015                                            |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |

## COURSE INFORMATION LETTER

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------|-------|------|-------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                                     |       |      |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                                     |       |      |       |
| <b>Course ID:</b> ÚINF/<br>IBdi/15                                                                                                                                                                      |       | <b>Course name:</b> Information security principles |       |      |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                                     |       |      |       |
| <b>Number of ECTS credits:</b> 3                                                                                                                                                                        |       |                                                     |       |      |       |
| <b>Recommended semester/trimester of the course:</b> 4., 6.                                                                                                                                             |       |                                                     |       |      |       |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                                     |       |      |       |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                                     |       |      |       |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                                     |       |      |       |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                                     |       |      |       |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                                     |       |      |       |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                                     |       |      |       |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                                     |       |      |       |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                                     |       |      |       |
| <b>Course assessment</b><br>Total number of assessed students: 28                                                                                                                                       |       |                                                     |       |      |       |
| A                                                                                                                                                                                                       | B     | C                                                   | D     | E    | FX    |
| 25.0                                                                                                                                                                                                    | 21.43 | 25.0                                                | 10.71 | 3.57 | 14.29 |
| <b>Provides:</b> RNDr. JUDr. Pavol Sokol, PhD.                                                                                                                                                          |       |                                                     |       |      |       |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                            |       |                                                     |       |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                                     |       |      |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                               |       |                                         |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                         |       |      |     |
| <b>Course ID:</b> ÚCHV/ACHU/03                                                                                                                                                                                                                                                                                                                                                                                                                      |       | <b>Course name:</b> Inorganic Chemistry |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                          |       |                                         |       |      |     |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                         |       |      |     |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                             |       |                                         |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                         |       |      |     |
| <b>Prerequisites:</b> ÚCHV/VCHU/10 or ÚCHV/VCHU/14 or ÚCHV/VCHU/15                                                                                                                                                                                                                                                                                                                                                                                  |       |                                         |       |      |     |
| <b>Conditions for course completion:</b><br>Test in the middle and at the end of the semester.<br>Oral examination.                                                                                                                                                                                                                                                                                                                                 |       |                                         |       |      |     |
| <b>Learning outcomes:</b><br>Aim of the course is to provide the students with a knowledge of systematic chemistry of non-metallic elements                                                                                                                                                                                                                                                                                                         |       |                                         |       |      |     |
| <b>Brief outline of the course:</b><br>Electronic configuration, abundance, use, physical and chemical properties, preparation, reactivity of non-metallic elements hydrogen, halogens, oxygen, sulphur, nitrogen, phosphorus, carbon, silicon, boron and rare gases. Binary and other compounds formed by these elements, their properties and reactivity. Metals and transition elements. Abundance, properties, reactivity, important compounds. |       |                                         |       |      |     |
| <b>Recommended literature:</b><br><a href="http://kosice.upjs.sk/~vladimir.zelenak/ACHU.htm">http://kosice.upjs.sk/~vladimir.zelenak/ACHU.htm</a> (ppt slides from the lectures as a support for self study)<br>Greenwood, N. N., Earnshaw, A: Chemistry of the Elements. Pergamon Press, Oxford, 1984<br>Atkins O., Overton T., Rourke J., Weller M., Armstrong F.: Inorganic Chemistry, University Press, Oxford, 2006.                           |       |                                         |       |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                         |       |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                         |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 710                                                                                                                                                                                                                                                                                                                                                                                  |       |                                         |       |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B     | C                                       | D     | E    | FX  |
| 10.14                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20.56 | 31.13                                   | 24.93 | 9.44 | 3.8 |
| <b>Provides:</b> prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                |       |                                         |       |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                         |       |      |     |

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                            |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |       |      |     |
| <b>Course ID:</b> ÚCHV/ACH2/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       | <b>Course name:</b> Inorganic Chemistry II |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                            |       |                                            |       |      |     |
| <b>Number of ECTS credits:</b> 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                            |       |      |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                            |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                            |       |      |     |
| <b>Prerequisites:</b> ÚCHV/ACH1/10 or ÚCHV/ACHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |       |      |     |
| <b>Conditions for course completion:</b><br>Written examination at the end of the course. The final mark is given by the sum of points from seminars (max. 10 points) and 3x30 points from written test, totally 100 points. To pass it is required to obtain at least 51 points as well as 51 % of points from every partial examination.                                                                                                                                                            |       |                                            |       |      |     |
| <b>Learning outcomes:</b><br>Goal of the course is to provide the students with a knowledge of systematic chemistry of metallic elements.                                                                                                                                                                                                                                                                                                                                                             |       |                                            |       |      |     |
| <b>Brief outline of the course:</b><br>Electronic configuration, abundance, use, physical and chemical properties and reactivity of the elements of the 1st, 2nd groups, transition metal elements, elements of the 12th group, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Se, Te, Po, lanthanides and actinides. Binary and other compounds formed by these elements, their properties and reactivity. General properties, structure and bonding in metals, co-ordination and organometallic compounds. |       |                                            |       |      |     |
| <b>Recommended literature:</b><br>1. Greenwood, N. N., Earnshaw, A: Chemistry of the Elements. Pergamon Press, Oxford, 1984<br>2. Shriver, D.F., Atkins, P.W., Langford, C. H.: Inorganic Chemistry. 2ndEd., Oxford University Press, Oxford, 1995                                                                                                                                                                                                                                                    |       |                                            |       |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                            |       |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                            |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 630                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                            |       |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | B     | C                                          | D     | E    | FX  |
| 12.06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 19.68 | 30.63                                      | 25.56 | 7.46 | 4.6 |
| <b>Provides:</b> prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                            |       |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                            |       |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                            |       |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                       |
| <b>Course ID:</b> ÚCHV/<br>ANCH1b/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Course name:</b> Instrumental Analytical Chemistry |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                       |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                       |
| <b>Conditions for course completion:</b><br>Test / Exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                       |
| <b>Learning outcomes:</b><br>Getting knowledge about the theoretical principles and instrumentation in analytical chemistry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                       |
| <b>Brief outline of the course:</b><br>Spectroscopic methods of analysis. Electromagnetic radiation. Basic components of spectroscopic instrumentation. Sources of energy. Detectors. Spectroscopy based on absorption. Transmittance and absorbance. Beer's Law. Limitations to Beer's Law. Ultraviolet-visible and infrared spectrophotometry. Atomic absorption spectroscopy. Spectroscopy based on emission. Molecular photoluminescence spectroscopy. Atomic emission spectroscopy. Spectroscopy based on scattering. Mass spectrometry. Electrochemical methods of analysis. Potentiometric methods of analysis. Reference electrodes. Membrane electrodes. Coulometric methods of analysis. Voltammetric methods of analysis. Chromatographic methods. General theory of column chromatography. Optimizing chromatographic separations. Gas chromatography. High-performance liquid chromatography. Ion-exchange chromatography. Supercritical fluid chromatography. |                                                       |
| <b>Recommended literature:</b><br>1. Labuda a kol. Analytická chémia. ISBN: 9788022742429, Vydavateľstvo: STU Bratislava, Rok vydania: 2014, Počet strán: 671<br>2. Christian G.D. Analytical Chemistry. John Wiley & Sons, Inc. New York – Chichester – Brisbane – Toronto – Singapore 1994.<br>3. Holtzclaw H.F., Jr., Robinson W.R. College Chemistry with Qualitative Analysis. D.C. Heath and Company 1988.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                       |

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| <b>Course assessment</b>                                                                                                                |      |       |       |       |      |
| Total number of assessed students: 538                                                                                                  |      |       |       |       |      |
| A                                                                                                                                       | B    | C     | D     | E     | FX   |
| 20.45                                                                                                                                   | 11.9 | 21.93 | 18.77 | 26.58 | 0.37 |
| <b>Provides:</b> prof. Mgr. Vasil' Andruch, DSc., RNDr. Rastislav Serbin, PhD., RNDr. Livia Kocúrová, PhD., RNDr. Jana Šandrejová, PhD. |      |       |       |       |      |
| <b>Date of last modification:</b> 31.01.2020                                                                                            |      |       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                 |      |       |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                             |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                             |
| <b>Course ID:</b> ÚCHV/<br>UECH/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Course name:</b> Introduction to Environmental Chemistry |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                             |
| <b>Conditions for course completion:</b><br>Oral examination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |
| <b>Learning outcomes:</b><br>Introduction to topics in environmental chemistry and basic procedures applied for environmental protection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             |
| <b>Brief outline of the course:</b><br>Introduction to Environmental Chemistry<br>Chemical aspects of pollution and environmental problems. Composition and behavior of the atmosphere. Energy balance of the Earth and climate changes. Principles of photochemistry, photoprocesses in the atmosphere. Petroleum, hydrocarbons and coal (characteristics, sources and environmental pollution). Soaps, polymers and synthetic surfactants. Haloorganics and pesticides. Environmental chemistry of some important elements (C, N, S, P, halogens, biologically important metals ...). Environmental chemistry in aqueous media. Aqueous systems, parameters, cycles and their protection. The Earth's crust (rocks, minerals, soils). Natural and artificial radioactivity, utilization. Energy and energy sources (fossil fuels, nuclear, geothermal, solar energy, wind and water energy). Solid waste disposal and recycling. |                                                             |
| <b>Recommended literature:</b><br>1. Gary W. van Loon, Stephen J. Duffy : Environmental Chemistry - A Global Perspective, Oxford University Press, Oxford 2003<br>2. R.A. Bailey, H.M. Clark, J.P. Ferris, S. Krause, R.L. Strong : Chemistry of the Environment, Academic Press, San Diego 2002<br>3. G. Schwedt: The Essential Guide to Environmental Chemistry, Wiley and Sons, London 2001<br>4. R.N. Reeve, J.D. Barnes: General Environmental Chemistry, Wiley, London 1994<br>5. G. Burton, J. Holman, G. Pilling, D. Waddington: Chemical Storylines, Heinemann, Oxford, London 1994<br>6. www                                                                                                                                                                                                                                                                                                                             |                                                             |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |

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| <b>Course assessment</b>                                                                |       |       |      |      |     |
| Total number of assessed students: 210                                                  |       |       |      |      |     |
| A                                                                                       | B     | C     | D    | E    | FX  |
| 48.57                                                                                   | 20.95 | 15.71 | 8.57 | 6.19 | 0.0 |
| <b>Provides:</b> doc. RNDr. Andrea Straková Fedorková, PhD.                             |       |       |      |      |     |
| <b>Date of last modification:</b> 20.09.2017                                            |       |       |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |       |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                          |                                                       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                             |                                                       |
| <b>Course ID:</b> Dek. PF<br>UPJŠ/USPV/13                                                                                                                                                                      | <b>Course name:</b> Introduction to Study of Sciences |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b> 12s / 3d<br><b>Course method:</b> present |                                                       |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                               |                                                       |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                        |                                                       |
| <b>Course level:</b> I.                                                                                                                                                                                        |                                                       |
| <b>Prerequisites:</b>                                                                                                                                                                                          |                                                       |
| <b>Conditions for course completion:</b>                                                                                                                                                                       |                                                       |
| <b>Learning outcomes:</b>                                                                                                                                                                                      |                                                       |
| <b>Brief outline of the course:</b>                                                                                                                                                                            |                                                       |
| <b>Recommended literature:</b>                                                                                                                                                                                 |                                                       |
| <b>Course language:</b>                                                                                                                                                                                        |                                                       |
| <b>Notes:</b>                                                                                                                                                                                                  |                                                       |
| <b>Course assessment</b><br>Total number of assessed students: 1554                                                                                                                                            |                                                       |
| abs                                                                                                                                                                                                            | n                                                     |
| 88.61                                                                                                                                                                                                          | 11.39                                                 |
| <b>Provides:</b> prof. RNDr. Viliam Geffert, DrSc.                                                                                                                                                             |                                                       |
| <b>Date of last modification:</b> 25.09.2019                                                                                                                                                                   |                                                       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                        |                                                       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                       |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                       |       |       |      |
| <b>Course ID:</b> ÚINF/<br>UGR1/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      | <b>Course name:</b> Introduction to computer graphics |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                     |      |                                                       |       |       |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                       |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                       |       |       |      |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                       |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                       |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |                                                       |       |       |      |
| <b>Learning outcomes:</b><br>To provide the students with knowledge of graphics algorithms and basic principles of computer graphics.                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                       |       |       |      |
| <b>Brief outline of the course:</b><br>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. |      |                                                       |       |       |      |
| <b>Recommended literature:</b><br>FOLEY, J. D., van DAM, A., FEINER, S., HUGHES, J.: Computer Graphics: Principles and Practice, Addison-Wesley, 1991<br>MORTENSON, M.E.: Geometric modeling, 2.ed., Willey, 1997                                                                                                                                                                                                                                                                                                                                                              |      |                                                       |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                       |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                                       |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 292                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                       |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | B    | C                                                     | D     | E     | FX   |
| 14.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9.93 | 13.36                                                 | 23.63 | 30.48 | 8.56 |
| <b>Provides:</b> prof. RNDr. Gabriel Semanišin, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                       |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                       |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                       |       |                                                     |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                          |       |                                                     |       |       |      |
| <b>Course ID:</b> ÚINF/<br>UNS1/15                                                                                                                                                                                                                                                                                                                                                                          |       | <b>Course name:</b> Introduction to neural networks |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                                                                  |       |                                                     |       |       |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                            |       |                                                     |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                                                                                     |       |                                                     |       |       |      |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                |       |                                                     |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                     |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                    |       |                                                     |       |       |      |
| <b>Learning outcomes:</b><br>To understand and to know applications of basic paradigms of neural networks. To learn working with software for neural network models.                                                                                                                                                                                                                                        |       |                                                     |       |       |      |
| <b>Brief outline of the course:</b><br>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. |       |                                                     |       |       |      |
| <b>Recommended literature:</b><br>J. Hertz, A.Krogh, R.G. Palmer: Introduction to the theory of neural computation, Addison Wesley, 1991<br>HASSOUN, M. H.: Fundamentals of artificial neural networks, The MIT Press, 1995                                                                                                                                                                                 |       |                                                     |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                     |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                     |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 420                                                                                                                                                                                                                                                                                                                                          |       |                                                     |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                           | B     | C                                                   | D     | E     | FX   |
| 12.38                                                                                                                                                                                                                                                                                                                                                                                                       | 16.67 | 23.33                                               | 19.76 | 23.33 | 4.52 |
| <b>Provides:</b> doc. RNDr. Gabriela Andrejková, CSc.                                                                                                                                                                                                                                                                                                                                                       |       |                                                     |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                |       |                                                     |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                                                                                     |       |                                                     |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                      |      |                                                          |     |     |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                         |      |                                                          |     |     |      |
| <b>Course ID:</b> ÚINF/<br>UIN1/15                                                                                                                                                                                         |      | <b>Course name:</b> Introduction to study of informatics |     |     |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present |      |                                                          |     |     |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                           |      |                                                          |     |     |      |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                    |      |                                                          |     |     |      |
| <b>Course level:</b> I.                                                                                                                                                                                                    |      |                                                          |     |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                      |      |                                                          |     |     |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                   |      |                                                          |     |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                  |      |                                                          |     |     |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                                        |      |                                                          |     |     |      |
| <b>Recommended literature:</b>                                                                                                                                                                                             |      |                                                          |     |     |      |
| <b>Course language:</b>                                                                                                                                                                                                    |      |                                                          |     |     |      |
| <b>Notes:</b>                                                                                                                                                                                                              |      |                                                          |     |     |      |
| <b>Course assessment</b><br>Total number of assessed students: 250                                                                                                                                                         |      |                                                          |     |     |      |
| A                                                                                                                                                                                                                          | B    | C                                                        | D   | E   | FX   |
| 40.0                                                                                                                                                                                                                       | 16.8 | 15.2                                                     | 9.6 | 3.6 | 14.8 |
| <b>Provides:</b> doc. RNDr. Stanislav Krajčí, PhD., RNDr. Ondrej Krídlo, PhD., Mgr. Alexander Szabari, PhD.                                                                                                                |      |                                                          |     |     |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                               |      |                                                          |     |     |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                    |      |                                                          |     |     |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                |      |                                                               |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                               |       |       |      |
| <b>Course ID:</b> ÚMV/<br>MZIa/10                                                                                                                                                                                                                                                                                                                                                                                    |      | <b>Course name:</b> Mathematical foundations of informatics I |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                                                                           |      |                                                               |       |       |      |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                               |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                              |      |                                                               |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                               |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                |      |                                                               |       |       |      |
| <b>Conditions for course completion:</b><br>Two tests and completion of individual homework.<br>Based on semestral evaluation and examination test.                                                                                                                                                                                                                                                                  |      |                                                               |       |       |      |
| <b>Learning outcomes:</b><br>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.                                                                                                                                                                                                                    |      |                                                               |       |       |      |
| <b>Brief outline of the course:</b><br>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.                                                                                                                                     |      |                                                               |       |       |      |
| <b>Recommended literature:</b><br>Huťka, Benko, Ďurikovič: Matematika, Alfa, Bratislava 1991<br>D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006<br>D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006<br>J. Ivan: Matematika 1, Alfa, Bratislava 1989<br>T. Katriňák a kol.: Algebra a teoretická aritmetika, Alfa, Bratislava 1986 |      |                                                               |       |       |      |
| <b>Course language:</b><br>Slovak                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                               |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                               |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 215                                                                                                                                                                                                                                                                                                                                                   |      |                                                               |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                    | B    | C                                                             | D     | E     | FX   |
| 0.47                                                                                                                                                                                                                                                                                                                                                                                                                 | 7.91 | 8.84                                                          | 16.28 | 45.12 | 21.4 |
| <b>Provides:</b> prof. RNDr. Tomáš Madaras, PhD., RNDr. Pavel Molnár, PhD.                                                                                                                                                                                                                                                                                                                                           |      |                                                               |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                         |      |                                                               |       |       |      |

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                |      |                                                                |      |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                                |      |       |      |
| <b>Course ID:</b> ÚMV/<br>MZIb/10                                                                                                                                                                                                                                                                                                                                                                                    |      | <b>Course name:</b> Mathematical foundations of informatics II |      |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                                                                           |      |                                                                |      |       |      |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                                |      |       |      |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                              |      |                                                                |      |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                                |      |       |      |
| <b>Prerequisites:</b> ÚMV/MZIa/10                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                                |      |       |      |
| <b>Conditions for course completion:</b><br>Based on results of two tests and individual homeworks.<br>Based on semestral evaluation and examination test.                                                                                                                                                                                                                                                           |      |                                                                |      |       |      |
| <b>Learning outcomes:</b><br>To extend the obtained knowledge in mathematics by topics in integral calculus, differential equations and infinite series.                                                                                                                                                                                                                                                             |      |                                                                |      |       |      |
| <b>Brief outline of the course:</b><br>Indefinite and definite integral and their applications. Differential equations. Series, convergence criteria. Series of functions, Taylor expansion. Periodic functions, trigonometric series, Fourier expansion.                                                                                                                                                            |      |                                                                |      |       |      |
| <b>Recommended literature:</b><br>Huťka, Benko, Ďurikovič: Matematika, Alfa, Bratislava 1991<br>D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006<br>D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006<br>J. Ivan: Matematika 2, Alfa, Bratislava 1989<br>T. Katriňák a kol.: Algebra a teoretická aritmetika, Alfa, Bratislava 1986 |      |                                                                |      |       |      |
| <b>Course language:</b><br>Slovak                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                                |      |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                                |      |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 107                                                                                                                                                                                                                                                                                                                                                   |      |                                                                |      |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                    | B    | C                                                              | D    | E     | FX   |
| 0.93                                                                                                                                                                                                                                                                                                                                                                                                                 | 9.35 | 8.41                                                           | 21.5 | 52.34 | 7.48 |
| <b>Provides:</b> prof. RNDr. Tomáš Madaras, PhD., RNDr. Pavel Molnár, PhD.                                                                                                                                                                                                                                                                                                                                           |      |                                                                |      |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                         |      |                                                                |      |       |      |

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |
| <b>Course ID:</b> ÚINF/<br>OSY1/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Course name:</b> Operating systems |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 0 <b>Per study period:</b> 28 / 0<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |
| <b>Number of ECTS credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |
| <b>Conditions for course completion:</b><br>Test and oral exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       |
| <b>Learning outcomes:</b><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.                                                                                                                                |                                       |
| <b>Brief outline of the course:</b><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. |                                       |
| <b>Recommended literature:</b><br>1. A. Silberschatz, G. Gagne, P. Baer: Operating System Concepts, Wiley, 2002<br>2. A. S. Tanenbaum: Modern Operating Systems, Prentice-Hall, 2001                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |

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|-----------------------------------------------------------------------------------------|-------|-------|-------|-------|-----|
| <b>Course assessment</b>                                                                |       |       |       |       |     |
| Total number of assessed students: 228                                                  |       |       |       |       |     |
| A                                                                                       | B     | C     | D     | E     | FX  |
| 25.44                                                                                   | 15.35 | 18.42 | 19.74 | 15.35 | 5.7 |
| <b>Provides:</b> doc. Ing. Štefánia Gallová, CSc., RNDr. PhDr. Peter Pisarčík           |       |       |       |       |     |
| <b>Date of last modification:</b> 14.01.2020                                            |       |       |       |       |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |       |       |       |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       |
| <b>Course ID:</b> ÚCHV/OCHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course name:</b> Organic chemistry |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |
| <b>Prerequisites:</b> ÚCHV/VCHU/15 or ÚCHV/VCHU/14 or ÚCHV/VCHU/10 or ÚCHV/VACH/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       |
| <b>Conditions for course completion:</b><br>Two tests at lecture in 7 and 14th week. Test max 50 points. At least 25 points required.<br>Written exam, 100 points. At least 49% of points required.<br>Final evaluation: A 90-100 pts, B 80-89 pts, C 70-79 pts, D 60-69 pts, E 50-59 pts, FX 0-49 pts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |
| <b>Learning outcomes:</b><br>Basic organic chemistry course.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |
| <b>Brief outline of the course:</b><br>Chemical bonding Hybridization and Bonding Covalent bonds Double bonds and Triple Bonds Structural Formulas of Organic Molecules Polar Covalent Bonds and Electronegativity Constitutional Isomers Alkenes Electrophilic Additions Strong Brønsted Acids Lewis Acids (non-Proton Electrophiles) Electrophilic Halogen Reagents Other Electrophilic Reagents Reduction Oxidation Radical Additions Allylic Substitution Alkynes Addition Reactions Hydrogenation Electrophiles Hydration & Tautomerism Hydroboration Nucleophilic Addition & Reduction Acidity of Terminal Alkynes (Substitution of H) Alkyl Halides General Reactivity Substitution (of X) SN2 Mechanism SN1 Mechanism Elimination (of HX) Summary of Substitution vs. Elimination Substitution by Metals Elimination Reactions of Dihalides Alcohols Reactions of Alcohols Substitution of the Hydroxyl H Substitution of the Hydroxyl Group Elimination of Water Oxidation of Alcohols Reactions of Phenols Acidity of Phenols Ring Substitution of Phenols Oxidation to Quinones Aromatic compounds Electrophilic Substitution A Substitution Mechanism Reactions of Substituted Benzenes Reaction Characteristics Reactions of Disubstituted Rings Reactions of Substituent Groups Nucleophilic Substitution, Elimination & Addition Reactions Amines Basicity of Nitrogen Compounds Acidity of Nitrogen Compounds Important Reagent Bases Reactions of Amines Electrophilic Substitution at Nitrogen Preparation of 1°-Amines Preparation of 2° & 3°-Amines Reactions with Nitrous Acid Reactions of Aryl Diazonium Intermediates Elimination Reactions of Amines Oxidation States of Nitrogen Basic information: Aldehydes & Ketones Carboxylic Acids Carboxylic Derivatives Natural products |                                       |
| <b>Recommended literature:</b><br>1. on-line ppt presentation in MOODLE, moodle.science.upjs.sk<br>2. Organic Chemistry, Clayden, Greeves Warren & Wothers, Oxford University Press, 2010<br>3. Organic Chemistry, Solomon, Wiley, 2009                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |

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|-----------------------------------------------------------------------------------------|------|-------|-------|-------|------|
| <b>Course language:</b>                                                                 |      |       |       |       |      |
| <b>Notes:</b>                                                                           |      |       |       |       |      |
| <b>Course assessment</b>                                                                |      |       |       |       |      |
| Total number of assessed students: 713                                                  |      |       |       |       |      |
| A                                                                                       | B    | C     | D     | E     | FX   |
| 3.23                                                                                    | 7.43 | 13.32 | 22.16 | 47.12 | 6.73 |
| <b>Provides:</b> prof. RNDr. Jozef Gonda, DrSc., RNDr. Slávka Hamuláková, PhD.          |      |       |       |       |      |
| <b>Date of last modification:</b> 27.03.2020                                            |      |       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |      |       |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                  |       |                                              |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                     |       |                                              |      |      |     |
| <b>Course ID:</b> ÚCHV/POCHU/15                                                                                                                                                                                                                                                                                        |       | <b>Course name:</b> Organic chemistry - Lab. |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 <b>Per study period:</b> 56<br><b>Course method:</b> present                                                                                                                |       |                                              |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                       |       |                                              |      |      |     |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                |       |                                              |      |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                |       |                                              |      |      |     |
| <b>Prerequisites:</b> ÚCHV/OCHU/03                                                                                                                                                                                                                                                                                     |       |                                              |      |      |     |
| <b>Conditions for course completion:</b><br>Two tests 2x25 p., twelve reports 12x2 p., laboratory skills 12 p., short quizzes and questions 14 p. A 100 p. in total.<br>Grades: A: 91-100b, B: 81-90b, C: 71-80b, D: 61-70b, E: 51-60b, Fx: 0-50b.<br>Based on continuous evaluation.                                  |       |                                              |      |      |     |
| <b>Learning outcomes:</b><br>Students will become familiar with the basic isolation and purification methods used in a synthetic laboratory. Students should master basic laboratory technique and be able to apply the theoretical knowledge from the basic course of organic chemistry in simple synthetic projects. |       |                                              |      |      |     |
| <b>Brief outline of the course:</b><br>Preparation, isolation, purification and identification of organic compounds. The emphasis is on gaining the experimental skills in synthesis of organic compounds, distillation, extraction, crystallization, sublimation and thin-layer chromatography.                       |       |                                              |      |      |     |
| <b>Recommended literature:</b><br>1. Handout with experimental procedures <a href="http://kekule.science.upjs.sk/pochu">http://kekule.science.upjs.sk/pochu</a> .<br>2. Organic chemistry lectures.                                                                                                                    |       |                                              |      |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                |       |                                              |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                          |       |                                              |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 139                                                                                                                                                                                                                                                     |       |                                              |      |      |     |
| A                                                                                                                                                                                                                                                                                                                      | B     | C                                            | D    | E    | FX  |
| 54.68                                                                                                                                                                                                                                                                                                                  | 27.34 | 11.51                                        | 5.76 | 0.72 | 0.0 |
| <b>Provides:</b> RNDr. Slávka Hamuláková, PhD., RNDr. Martin Walko, PhD., RNDr. Mária Vilková, PhD., RNDr. Ladislav Janovec, PhD., RNDr. Ján Elečko, PhD.                                                                                                                                                              |       |                                              |      |      |     |
| <b>Date of last modification:</b> 05.02.2020                                                                                                                                                                                                                                                                           |       |                                              |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                |       |                                              |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          |
| <b>Course ID:</b> ÚCHV/<br>OCH1b/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Course name:</b> Organic chemistry II |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |
| <b>Number of ECTS credits:</b> 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |
| <b>Conditions for course completion:</b><br>Two tests at lecture in 7 and 14th week. Test max 50 points. At least 25 points required.<br>Written exam, 100 points. At least 49% of points required.<br>Final evaluation: A 90-100 pts, B 80-89 pts, C 70-79 pts, D 60-69 pts, E 50-59 pts, FX 0-49 pts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                          |
| <b>Learning outcomes:</b><br>Second part of two-semester organic chemistry course.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          |
| <b>Brief outline of the course:</b><br>Reaction Mechanisms, Mechanisms of Organic Reactions, Reactive Intermediates, Ionic Reactions<br>Radical Reactions Bond Energy Reaction Energetics Activation Energy Reaction Rates and<br>Kinetics Thermodynamic and Chemical Stability Aromaticity Benzene and Other Aromatic<br>Compounds Fused Benzene Ring Compounds Other Aromatic Systems Factors Required for<br>Aromaticity Stereoisomers Chirality and Symmetry Enantiomorphism Polarimetry Optical Activity<br>Designating the Configuration of Stereogenic Centers The Sequence Rule for Assignment of<br>Configurations to Stereogenic Carbons Compounds Having Two or More Stereogenic Centers<br>Stereogenic Nitrogen Fischer Projection Formulas Aldehydes & Ketones Natural Products<br>Synthetic Preparation Properties of Aldehydes & Ketones Reversible Addition Reactions Hydration<br>& Hemiacetal Formation Acetal Formation Imine Formation Enamine Formation Cyanohydrin<br>Formation Irreversible Addition Reactions Complex Metal Hydrides Organometallic Reagents<br>Carbonyl Group Modification Wolff-Kishner Reduction Clemmensen Reduction Hydrogenolysis<br>of Thioacetals Oxidations Reactions at the $\alpha$ -Carbon Mechanism of Electrophilic $\alpha$ -Substitution<br>The Aldol Reaction Ambident Enolate Anions Alkylation of Enolate Anions Carboxylic Acids<br>Natural Products Related Derivatives Preparation of Carboxylic Acids Reactions of Carboxylic<br>Acids Salt Formation Substitution of Hydroxyl Hydrogen Substitution of the Hydroxyl Group<br>Reduction & Oxidation Carboxylic Derivatives Reactions of Carboxylic Acid Derivatives Acyl<br>Group Substitution Mechanism Reduction Catalytic Reduction Metal Hydride Reduction Diborane<br>Reduction Reaction with Organometallic Reagents Reactions at the $\alpha$ Carbon Acidity of a<br>C-H The Claisen Condensation Synthesis Applications Carbohydrates Glucose The Structure<br>and Configuration of Glucose Anomeric Forms of Monosaccharides Glycosides Disaccharides<br>Polysaccharides Lipids Fatty Acids Soaps & Detergents Fats & Oils Nucleic Acids Alkaloids<br>Terpenes |                                          |

**Recommended literature:**

1. on-line moodle.science.upjs.sk
2. Organic Chemistry, Clayden, Greeves Warren & Wothers, Oxford University Press, 2010
3. Organic Chemistry, Solomon, Willey, 2009

**Course language:****Notes:****Course assessment**

Total number of assessed students: 595

| A     | B     | C     | D     | E     | FX   |
|-------|-------|-------|-------|-------|------|
| 12.27 | 11.26 | 16.81 | 21.68 | 35.13 | 2.86 |

**Provides:** prof. RNDr. Jozef Gonda, DrSc., doc. RNDr. Miroslava Martinková, PhD.

**Date of last modification:** 03.05.2015

**Approved:** doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.

## COURSE INFORMATION LETTER

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|-------|-------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                  |       |                              |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                     |       |                              |       |       |      |
| <b>Course ID:</b> KPE/<br>Pg/15                                                                                                                                                                        |       | <b>Course name:</b> Pedagogy |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                              |       |       |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                       |       |                              |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                                            |       |                              |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                |       |                              |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                  |       |                              |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                               |       |                              |       |       |      |
| <b>Learning outcomes:</b>                                                                                                                                                                              |       |                              |       |       |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                    |       |                              |       |       |      |
| <b>Recommended literature:</b>                                                                                                                                                                         |       |                              |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                |       |                              |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                          |       |                              |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 512                                                                                                                                     |       |                              |       |       |      |
| A                                                                                                                                                                                                      | B     | C                            | D     | E     | FX   |
| 21.68                                                                                                                                                                                                  | 24.22 | 25.78                        | 16.02 | 11.33 | 0.98 |
| <b>Provides:</b> PaedDr. Renáta Orosová, PhD., Mgr. Zuzana Boberová, PhD.                                                                                                                              |       |                              |       |       |      |
| <b>Date of last modification:</b> 13.09.2019                                                                                                                                                           |       |                              |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                |       |                              |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                         |       |                                        |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                            |       |                                        |       |       |      |
| <b>Course ID:</b> ÚCHV/<br>FCHU/10                                                                                                                                                                                                                                                                                                                                            |       | <b>Course name:</b> Physical Chemistry |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28<br><b>Course method:</b> present                                                                                                                                                    |       |                                        |       |       |      |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                              |       |                                        |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                       |       |                                        |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                       |       |                                        |       |       |      |
| <b>Prerequisites:</b> ÚCHV/VCHU/14 or ÚCHV/VCHU/10 or ÚCHV/VACH/10 or ÚCHV/VCHU/15                                                                                                                                                                                                                                                                                            |       |                                        |       |       |      |
| <b>Conditions for course completion:</b><br>Two partial tests from computational seminars.<br>Examination.                                                                                                                                                                                                                                                                    |       |                                        |       |       |      |
| <b>Learning outcomes:</b><br>To provide the students with basic knowledge of physical chemistry.                                                                                                                                                                                                                                                                              |       |                                        |       |       |      |
| <b>Brief outline of the course:</b><br>Fundamental concepts of thermodynamics, thermochemistry, chemical equilibrium, phase equilibria and diagrams, laws for ideal gas and reals gases, liquids, solutions, solutions of electrolytes. Electrochemistry: ionics and electrodicts. Electrodes and electrochemical cells, corrosion. Chemical kinetics, catalysis. Adsorption. |       |                                        |       |       |      |
| <b>Recommended literature:</b><br>T. Engel, P. Reid: Physical Chemistry, Pearson Educat. Inc., San Francisco 2006<br>P.W. Atkins: Physical Chemistry, Oxford University Presss, Oxford 1986, 1990, 1996<br>W.J. Moore: Physical Chemistry, Longman, London 1972 and newer editions                                                                                            |       |                                        |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                       |       |                                        |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                 |       |                                        |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 258                                                                                                                                                                                                                                                                                                            |       |                                        |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                                                             | B     | C                                      | D     | E     | FX   |
| 31.4                                                                                                                                                                                                                                                                                                                                                                          | 20.16 | 14.34                                  | 17.05 | 13.18 | 3.88 |
| <b>Provides:</b> prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD.                                                                                                                                                                                                                                                                                    |       |                                        |       |       |      |
| <b>Date of last modification:</b> 27.03.2020                                                                                                                                                                                                                                                                                                                                  |       |                                        |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajči, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                       |       |                                        |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                           |
| <b>Course ID:</b> ÚCHV/<br>FCH1b/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Course name:</b> Physical Chemistry II |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                           |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                           |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |
| <b>Prerequisites:</b> ÚCHV/FCH1a/03 or ÚCHV/FCHU/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |
| <b>Conditions for course completion:</b><br>Two partial tests from computational seminars in 6th and 12th week of semester.<br>Examination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                           |
| <b>Learning outcomes:</b><br>Understandable explain to students the principles of chemical kinetics of processes, to elucidate the kinetics and mechanism of some reactions. To analyse particularly the equilibrium and kinetics of electrode processes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                           |
| <b>Brief outline of the course:</b><br>Electrochemistry. Equilibrium homogeneous processesn electrolyte solutions. Charge transfer in electrolyte solutions. Nonequilibrium homogeneous processes. Trnasport processes in electrolyte solutions. Conductance and molar conductivity. Hindering effects. Transport numbers. Equilibrium in heterogeneous electrochemical systems. Pocesses on charged interfaces. Electrochemical cells and fuel cells. Classification of electrode types. Concentration cells. Electrolysis. Electrochemical power sources. Potentiometry. Electrical double layer. Surface tension.<br>Chemical kinetics. Homogeneous processes. Reaction rate. Reaction order. Classification of chemical reactions. Elementary chemical reactions. Mechanism and kinetics equations of complicated chemical processes. Methods of rate low determination. Theory of chemical kinetics. Ttemperature dependence of reaction rates. Collision theory. Activated complex theory. Chain reactions. Structure and rate lows of chain reactions. Explosion. Polymerisation reactions. Photochemical reactions. Catalysis. Theory of homogeneous catalysis. Chemical oscillation reactions. Heterogeneous processes. Difusion. Physical and chemical adsorption. Adsorption and diffusion. Processes in heterogeneous electrochemical systems. Electrode kinetics, activation and diffusive mechanism of charge transfer.<br>Application of theoretical relationships on the solving of concrete problems and on the calculation of examples during seminars. |                                           |
| <b>Recommended literature:</b><br>T. Engel, P. Reid : Physical Chemistry, Pearson Educat. Inc., San Francisco 2006<br>P.W. Atkins : Physical Chemistry,Oxford University Presss, Oxford 1986, 1990, 1994, 1998<br>W.J. Moore : Physical Chemistry,Longman, London 1972 and newer editions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                           |

|                                                                                         |       |       |       |       |      |
|-----------------------------------------------------------------------------------------|-------|-------|-------|-------|------|
| <b>Course language:</b>                                                                 |       |       |       |       |      |
| <b>Notes:</b>                                                                           |       |       |       |       |      |
| <b>Course assessment</b>                                                                |       |       |       |       |      |
| Total number of assessed students: 536                                                  |       |       |       |       |      |
| A                                                                                       | B     | C     | D     | E     | FX   |
| 15.49                                                                                   | 18.66 | 22.57 | 18.84 | 20.52 | 3.92 |
| <b>Provides:</b> prof. RNDr. Renáta Oriňáková, DrSc., RNDr. Lenka Lorencová, PhD.       |       |       |       |       |      |
| <b>Date of last modification:</b> 20.09.2017                                            |       |       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |       |       |       |      |

## COURSE INFORMATION LETTER

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------|-------|------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                          |       |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                          |       |      |      |
| <b>Course ID:</b> ÚFV/<br>FPCh/08                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | <b>Course name:</b> Physics for Chemists |       |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                     |       |                                          |       |      |      |
| <b>Number of ECTS credits:</b> 6                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                          |       |      |      |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                          |       |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                          |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                          |       |      |      |
| <b>Conditions for course completion:</b><br>Test-papers (2).<br>Exam.                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                          |       |      |      |
| <b>Learning outcomes:</b><br>Completing the course students will get knowledge of fundamental physical laws and will understand their relation to chemistry.                                                                                                                                                                                                                                                                                                                                   |       |                                          |       |      |      |
| <b>Brief outline of the course:</b><br>Kinematics and dynamics of mass point, rigid bodies and fluids. Structure and properties of materia. The kinetic theory of gases and the foundations of thermodynamics. Structure and properties of liquids. Mechanical properties of solids, Hooke's Law. Stationary el. field and constant electric current. Magnetic field. Optics.                                                                                                                  |       |                                          |       |      |      |
| <b>Recommended literature:</b><br>1. V. Hajko, J. Daniel-Szabó: Základy fyziky. Veda, Bratislava, 1980.<br>2. Š. Veis, J. Maďar, V. Martišovič: Všeobecná fyzika 1, Mechanika a molekulová fyzika. Alfa, Bratislava, 1978.<br>3. P. Čičmanec: Všeobecná fyzika 2, Elektrina a magnetizmus. Alfa, Bratislava, 1980.<br>4. R.P. Feynman, R.B. Leighton, M. Sands: Feynmanove prednášky z fyziky 1-5. Alfa, Bratislava, 1985.<br>5. V. Hajko a kol.: Fyzika v príkladoch. Alfa, Bratislava, 1983. |       |                                          |       |      |      |
| <b>Course language:</b><br>Slovak language.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                          |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                          |       |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 544                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                          |       |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | B     | C                                        | D     | E    | FX   |
| 20.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 29.78 | 29.23                                    | 12.87 | 7.17 | 0.18 |
| <b>Provides:</b> doc. Mgr. Gregor Bánó, PhD., RNDr. Zuzana Jurašeková, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                          |       |      |      |

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|-----------------------------------------------------------------------------------------|
| <b>Date of last modification:</b> 03.05.2015                                            |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |

## COURSE INFORMATION LETTER

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------|-----|-----|-----|-----|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                |       |                                                             |     |     |     |     |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                             |     |     |     |     |     |
| <b>Course ID:</b> ÚCHV/<br>ADP/03                                                                                                                                                                                                                                                                                                                                                                                                    |       | <b>Course name:</b> Porous materials and their applications |     |     |     |     |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                           |       |                                                             |     |     |     |     |     |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                             |     |     |     |     |     |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                                                                                                                                                              |       |                                                             |     |     |     |     |     |
| <b>Course level:</b> I., II., III.                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                             |     |     |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                             |     |     |     |     |     |
| <b>Conditions for course completion:</b><br>Written test in the middle and the end of the semester.                                                                                                                                                                                                                                                                                                                                  |       |                                                             |     |     |     |     |     |
| <b>Learning outcomes:</b><br>To make the acquaintance of various types of advanced porous solids and basic methods for their investigation. To get up the students with the methods used in characterisation of specific surface area and pore size of different types of porous materials.                                                                                                                                          |       |                                                             |     |     |     |     |     |
| <b>Brief outline of the course:</b><br>Terminology and principal terms associated with powders, porous solids and adsorption. Methodology of adsorption at the gas-solid interface, liquid-solid interface. Assessment of surface area and porosity. Inorganic materials (active carbon, metal oxides, zeolites, clay minerals, new advanced materials) and phenomenon of adsorption. Application in the industry and everyday life. |       |                                                             |     |     |     |     |     |
| <b>Recommended literature:</b><br>1. F. Rouquerol, J. Rouquerol, K. Sing: Adsorption by powders and porous solids, Academic press, London, UK, 1999<br>2. S. J. Gregg, K.S.W. Sing: Adsorption, surface area and porosity, Academic Press, London,, UK, 1982.<br>3. V. Zelenák: Adsorption and porosity of solid substances, internal study text, PF UPJŠ, 2007.                                                                     |       |                                                             |     |     |     |     |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                             |     |     |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                             |     |     |     |     |     |
| <b>Course assessment</b><br>Total number of assessed students: 87                                                                                                                                                                                                                                                                                                                                                                    |       |                                                             |     |     |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                    | B     | C                                                           | D   | E   | FX  | N   | P   |
| 78.16                                                                                                                                                                                                                                                                                                                                                                                                                                | 10.34 | 2.3                                                         | 0.0 | 0.0 | 0.0 | 0.0 | 9.2 |
| <b>Provides:</b> prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                             |     |     |     |     |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                             |     |     |     |     |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                              |       |                                                             |     |     |     |     |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                            |      |                                         |     |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                               |      |                                         |     |      |     |
| <b>Course ID:</b><br>KPPaPZ/PP/15                                                                                                                                                                |      | <b>Course name:</b> Positive Psychology |     |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: 2 Per study period: 28</b><br><b>Course method:</b> present |      |                                         |     |      |     |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                 |      |                                         |     |      |     |
| <b>Recommended semester/trimester of the course:</b> 4., 6.                                                                                                                                      |      |                                         |     |      |     |
| <b>Course level:</b> I.                                                                                                                                                                          |      |                                         |     |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                            |      |                                         |     |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                                         |      |                                         |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                        |      |                                         |     |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                              |      |                                         |     |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                   |      |                                         |     |      |     |
| <b>Course language:</b>                                                                                                                                                                          |      |                                         |     |      |     |
| <b>Notes:</b>                                                                                                                                                                                    |      |                                         |     |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 219                                                                                                                               |      |                                         |     |      |     |
| A                                                                                                                                                                                                | B    | C                                       | D   | E    | FX  |
| 98.17                                                                                                                                                                                            | 0.91 | 0.46                                    | 0.0 | 0.46 | 0.0 |
| <b>Provides:</b> Mgr. Jozef Benka, PhD. et PhD.                                                                                                                                                  |      |                                         |     |      |     |
| <b>Date of last modification:</b> 25.03.2020                                                                                                                                                     |      |                                         |     |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                          |      |                                         |     |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                        |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                        |      |      |      |
| <b>Course ID:</b> ÚCHV/PACHU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       | <b>Course name:</b> Practical from Inorganic Chemistry |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 <b>Per study period:</b> 56<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                        |      |      |      |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                        |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                        |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                        |      |      |      |
| <b>Prerequisites:</b> ÚCHV/VCHU/14 or ÚCHV/VCHU/15 or ÚCHV/VCHU/10 or ÚCHV/VACH/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                        |      |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                        |      |      |      |
| <b>Learning outcomes:</b><br>The practical acquirements at preparation and study of inorganic compounds and their physico-chemical properties by common laboratory techniques.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                        |      |      |      |
| <b>Brief outline of the course:</b><br>The utilization of common laboratory techniques for preparation of elements (H <sub>2</sub> , O <sub>2</sub> , Cu, Ni), oxides(CO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> ·xH <sub>2</sub> O), nitrides(Mg <sub>3</sub> N <sub>2</sub> ), acids (HNO <sub>3</sub> , H <sub>3</sub> BO <sub>3</sub> ), salts((NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , KMnO <sub>4</sub> ), binary salts(NH <sub>4</sub> )Fe(SO <sub>4</sub> ) <sub>2</sub> ·12H <sub>2</sub> O), halides (CuCl, CuCl <sub>2</sub> ·2H <sub>2</sub> O, SnI <sub>4</sub> , CuBr <sub>2</sub> ) and coordination compounds ([Cr <sub>2</sub> (CH <sub>3</sub> COO) <sub>4</sub> (H <sub>2</sub> O) <sub>2</sub> ], [CoCl <sub>2</sub> (en) <sub>2</sub> ]Cl, [Cu(NH <sub>3</sub> ) <sub>4</sub> ]SO <sub>4</sub> ·H <sub>2</sub> O, K <sub>3</sub> [Al(C <sub>2</sub> O <sub>4</sub> ) <sub>3</sub> ]·3H <sub>2</sub> O). |       |                                                        |      |      |      |
| <b>Recommended literature:</b><br>Z. Vargová, J. Kuchár: Praktikum z anorganickej chémie, Košice, 2008<br>M. Reháková, M. Dzurillová, V. Zeleňák, V. Urvichiarová: Laboratórna technika, PF UPJŠ, Košice, 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                        |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                        |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                        |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 484                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                        |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | B     | C                                                      | D    | E    | FX   |
| 51.65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27.07 | 15.08                                                  | 2.89 | 2.27 | 1.03 |
| <b>Provides:</b> doc. RNDr. Juraj Kuchár, PhD., RNDr. Martin Vavra, PhD., RNDr. Miroslava Matiková-Maľarová, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                        |      |      |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                        |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                        |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                     |      |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                     |      |      |     |
| <b>Course ID:</b> ÚCHV/<br>PFCU/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       | <b>Course name:</b> Practical in Physical Chemistry |      |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 <b>Per study period:</b> 42<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                     |       |                                                     |      |      |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                     |      |      |     |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                     |      |      |     |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                     |      |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                     |      |      |     |
| <b>Conditions for course completion:</b><br>Approved laboratory reports.<br>Assessment.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                     |      |      |     |
| <b>Learning outcomes:</b><br>Theoretical principles, description of each technique and appropriate physical chemistry experiments.                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                     |      |      |     |
| <b>Brief outline of the course:</b><br>Experimental verification of theoretical knowledge on thermodynamics, thermochemistry, chemical equilibria (determination of enthalpy, phase diagrams), colligative properties (cryoscopy, ebullioscopy), adsorption.<br>Experimental verification of theoretical knowledge on electrochemistry (conductivity, dissociation constants, activity coefficients, electromotive force of galvanic cell, Daniell cell, potentials, polarography) and chemical kinetics (determination of rate constants). |       |                                                     |      |      |     |
| <b>Recommended literature:</b><br>B.P. Levitt: Findlay's Practical Physical Chemistry, Longman, London 1973<br>W.J. Moore: Physical Chemistry, Longman, London 1972<br>P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002                                                                                                                                                                                                                                                                                      |       |                                                     |      |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                     |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                     |      |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 323                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                     |      |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | B     | C                                                   | D    | E    | FX  |
| 72.45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 21.67 | 4.95                                                | 0.62 | 0.31 | 0.0 |
| <b>Provides:</b> RNDr. František Kaľavský, RNDr. Andrea Morovská Turoňová, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                     |      |      |     |
| <b>Date of last modification:</b> 18.09.2017                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                     |      |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                     |      |      |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |
| <b>Course ID:</b> ÚINF/<br>PRP2/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Course name:</b> Principles of computers |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |
| <b>Learning outcomes:</b> <ul style="list-style-type: none"> <li>- Know brief history of computer, classification and construction principles of computers of von Neumann type.</li> <li>- 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.</li> <li>- 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.</li> <li>- Know principles of communication of processor and other devices via interruptions and direct memory access.</li> <li>- Get idea of device drivers, device controllers and their functionality.</li> </ul> |                                             |
| <b>Brief outline of the course:</b><br>Brief outline of the course: <ul style="list-style-type: none"> <li>- computers of von Neumann type,</li> <li>- history of computers,</li> <li>- binary encoding of real numbers and integers,</li> <li>- realization of computers parts by sequence and combination circuits,</li> <li>- principles of various memory cells and memory matrices,</li> <li>- types of memories,</li> <li>- architecture of processor on levels of digital logic, machine cycle, instruction cycle,</li> <li>- input and output devices,</li> <li>- principles of interruptions,</li> <li>- direct memory access,</li> <li>- device drivers,</li> <li>- device controllers,</li> <li>- peripheral devices.</li> </ul>                                                                                   |                                             |
| <b>Recommended literature:</b><br>1. W. Stallings: Computer Organization and Architecture, Prentice Hall, 2002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |

|                                                                                         |      |       |       |       |      |
|-----------------------------------------------------------------------------------------|------|-------|-------|-------|------|
| <b>Course language:</b>                                                                 |      |       |       |       |      |
| <b>Notes:</b>                                                                           |      |       |       |       |      |
| <b>Course assessment</b>                                                                |      |       |       |       |      |
| Total number of assessed students: 180                                                  |      |       |       |       |      |
| A                                                                                       | B    | C     | D     | E     | FX   |
| 28.33                                                                                   | 15.0 | 16.67 | 15.56 | 23.89 | 0.56 |
| <b>Provides:</b> doc. Ing. Štefánia Gallová, CSc., RNDr. Juraj Šebej, PhD.              |      |       |       |       |      |
| <b>Date of last modification:</b> 13.01.2020                                            |      |       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |      |       |       |       |      |

## COURSE INFORMATION LETTER

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |                                                    |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |                                                    |
| <b>Course ID:</b> ÚINF/<br>PBS/15                                                                                                                                                                       | <b>Course name:</b> Pro-seminar to bachelor thesis |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 1 <b>Per study period:</b> 14<br><b>Course method:</b> present |                                                    |
| <b>Number of ECTS credits:</b> 1                                                                                                                                                                        |                                                    |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                 |                                                    |
| <b>Course level:</b> I.                                                                                                                                                                                 |                                                    |
| <b>Prerequisites:</b>                                                                                                                                                                                   |                                                    |
| <b>Conditions for course completion:</b>                                                                                                                                                                |                                                    |
| <b>Learning outcomes:</b>                                                                                                                                                                               |                                                    |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |                                                    |
| <b>Recommended literature:</b>                                                                                                                                                                          |                                                    |
| <b>Course language:</b>                                                                                                                                                                                 |                                                    |
| <b>Notes:</b>                                                                                                                                                                                           |                                                    |
| <b>Course assessment</b><br>Total number of assessed students: 272                                                                                                                                      |                                                    |
| abs                                                                                                                                                                                                     | n                                                  |
| 93.38                                                                                                                                                                                                   | 6.62                                               |
| <b>Provides:</b> RNDr. Ľubomír Antoni, PhD., RNDr. Ondrej Krídlo, PhD.                                                                                                                                  |                                                    |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                            |                                                    |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |                                                    |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                      |       |                                                           |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                         |       |                                                           |       |       |      |
| <b>Course ID:</b> ÚINF/SPP1a/15                                                                                                                                                                                            |       | <b>Course name:</b> Programming environments in schools I |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present |       |                                                           |       |       |      |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                           |       |                                                           |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                    |       |                                                           |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                    |       |                                                           |       |       |      |
| <b>Prerequisites:</b> ÚINF/PAZ1a/15                                                                                                                                                                                        |       |                                                           |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                   |       |                                                           |       |       |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                  |       |                                                           |       |       |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                                        |       |                                                           |       |       |      |
| <b>Recommended literature:</b>                                                                                                                                                                                             |       |                                                           |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                    |       |                                                           |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                              |       |                                                           |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 299                                                                                                                                                         |       |                                                           |       |       |      |
| A                                                                                                                                                                                                                          | B     | C                                                         | D     | E     | FX   |
| 33.78                                                                                                                                                                                                                      | 19.06 | 17.73                                                     | 13.71 | 11.04 | 4.68 |
| <b>Provides:</b> doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD.                                                                                                                                                 |       |                                                           |       |       |      |
| <b>Date of last modification:</b> 02.03.2020                                                                                                                                                                               |       |                                                           |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                    |       |                                                           |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                               |       |                                                            |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                  |       |                                                            |      |      |      |
| <b>Course ID:</b> ÚINF/SPP1b/15                                                                                                                                                                                                                                                                                                                                     |       | <b>Course name:</b> Programming environments in schools II |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28<br><b>Course method:</b> present                                                                                                                                          |       |                                                            |      |      |      |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                                                                                                                                                                                                    |       |                                                            |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                                                                                             |       |                                                            |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                             |       |                                                            |      |      |      |
| <b>Prerequisites:</b> ÚINF/SPP1a/15                                                                                                                                                                                                                                                                                                                                 |       |                                                            |      |      |      |
| <b>Conditions for course completion:</b><br>Creation of educational software in selected educational programming environment.                                                                                                                                                                                                                                       |       |                                                            |      |      |      |
| <b>Learning outcomes:</b><br>1. To get an overview of children's programming environments.<br>2. To acquire programming skills in selected children's programming environments.<br>3. Ability to design and program educational software in educational programming environments.                                                                                   |       |                                                            |      |      |      |
| <b>Brief outline of the course:</b><br>Teaching of algorithms and programming in elementary school - the objectives, content, textbooks and methodological materials. Algorithmic computer games. Overview of children's programming environments. Programming in environments - Scratch, App Inventor, MakeCode, MicroPython. Development of educational software. |       |                                                            |      |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                      |       |                                                            |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                             |       |                                                            |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                       |       |                                                            |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 16                                                                                                                                                                                                                                                                                                   |       |                                                            |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                   | B     | C                                                          | D    | E    | FX   |
| 25.0                                                                                                                                                                                                                                                                                                                                                                | 18.75 | 12.5                                                       | 25.0 | 6.25 | 12.5 |
| <b>Provides:</b> doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD.                                                                                                                                                                                                                                                                                          |       |                                                            |      |      |      |
| <b>Date of last modification:</b> 01.04.2020                                                                                                                                                                                                                                                                                                                        |       |                                                            |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                             |       |                                                            |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                 |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                 |
| <b>Course ID:</b> ÚINF/<br>PRS/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Course name:</b> Programming of robotic kits |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 <b>Per study period:</b> 42<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                 |
| <b>Number of ECTS credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                 |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                 |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                 |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                 |
| <b>Conditions for course completion:</b><br>Assessment of individual work on computers for a number of sub-assignments - robotic mini-project.<br>Creating and presenting a programmed robotic model including documentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                 |
| <b>Learning outcomes:</b><br>1. To acquire an overview of robotic sets and robotic programming environments.<br>2. To acquire skills in constructing and programming robots in selected robotic programming environments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                 |
| <b>Brief outline of the course:</b><br>Robotic set (Lego Mindstorms) - components, engines, sensors, basics of constructing of the mechanical parts of the model. Programming robotic models in languages NXT-G and NXC - branching statements, loops, blocks, events, parallel processes that work with sensors, datalogging, communication between several NXT bricks. Creating mini-project (eg, traffic lights, parking, dance creations, guitar, smart thermometer, measuring distance). Robotic competition, ideas for demanding projects. Creation and presentation of the final project - a programmed robot model (eg, navigate a maze, sports, paramedic) including documentation.                              |                                                 |
| <b>Recommended literature:</b><br>1. BUMGARDNER, J. (2007) The Origins of Mindstorms. Wired, 2007. <a href="http://www.wired.com/geekdad/2007/03/the_origins_of_/">http://www.wired.com/geekdad/2007/03/the_origins_of_/</a><br>2. Carnegie Mellon. Robotics Academy. <a href="http://www.education.rec.ri.cmu.edu/">http://www.education.rec.ri.cmu.edu/</a><br>3. KABÁTOVÁ, M. a kol. (2010) Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika: Didaktika robotických stavebníc. Bratislava : ŠPÚ, 2010. ISBN 978-80-8118-070-5<br>4. JAKEŠ, T. (2014) LEGO MINDSTORMS NXT - Robotické vzdelávaní, ZČU v Plzni, 2014. <a href="https://lego.zcu.cz/web/">https://lego.zcu.cz/web/</a> |                                                 |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                 |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                 |

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|----------------------------------------------------------------------------------------------------------|------|-------|------|-----|-------|
| <b>Course assessment</b>                                                                                 |      |       |      |     |       |
| Total number of assessed students: 44                                                                    |      |       |      |     |       |
| A                                                                                                        | B    | C     | D    | E   | FX    |
| 47.73                                                                                                    | 25.0 | 13.64 | 2.27 | 0.0 | 11.36 |
| <b>Provides:</b> doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD., RNDr. Zuzana Bednárová, PhD. |      |       |      |     |       |
| <b>Date of last modification:</b> 03.05.2015                                                             |      |       |      |     |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                  |      |       |      |     |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                              |
| <b>Course ID:</b> ÚINF/<br>PSW1/06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Course name:</b> Programming of web-pages |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                              |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |
| <b>Learning outcomes:</b><br>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.                                                                                                                                                                                                                                                                                                                                                                                                  |                                              |
| <b>Brief outline of the course:</b><br>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.                                                                                                                                                                                                                                                                                                            |                                              |
| <b>Recommended literature:</b><br>GILMORE, W. Jason. Beginning PHP and MySQL: from novice to professional. 4th ed. New York: Apress, 2010. ISBN 978-143-0231-141.<br>KOSEK, Jiří. PHP - tvorba interaktivních internetových aplikací: podrobný průvodce. Vyd. 1. Praha: Grada, 1999, 490 s. Průvodce (Grada). ISBN 80-716-9373-1.<br>SUEHRING, Steve a Janet VALADE. <i>PHP, MySQL, JavaScript</i>. Vyd. 1. Brno: Computer Press, 2006, xxiv, 692 pages. --For dummies. ISBN 978-1-118-21370-4.<br>HUSEBY, Sverre H. Zranitelný kód. Brno: Computer Press, 2006, 207 s. ISBN 80-251-1180-6.<br>THE OWASP FOUNDATION. OWASP [online]. 2014 [cit. 2014-02-26]. Dostupné z: <a href="https://www.owasp.org/index.php/Main_Page">https://www.owasp.org/index.php/Main_Page</a> |                                              |
| <b>Course language:</b><br>slovak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                              |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                              |

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|-----------------------------------------------------------------------------------------|-----|-----|-----|------|------|
| <b>Course assessment</b>                                                                |     |     |     |      |      |
| Total number of assessed students: 200                                                  |     |     |     |      |      |
| A                                                                                       | B   | C   | D   | E    | FX   |
| 9.5                                                                                     | 8.5 | 9.5 | 9.0 | 22.5 | 41.0 |
| <b>Provides:</b> doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD.              |     |     |     |      |      |
| <b>Date of last modification:</b> 27.03.2020                                            |     |     |     |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |     |     |     |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                             |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             |
| <b>Course ID:</b> ÚINF/<br>PAZ1a/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Course name:</b> Programming, algorithms, and complexity |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 / 4 <b>Per study period:</b> 42 / 56<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             |
| <b>Number of ECTS credits:</b> 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                             |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                             |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                             |
| <b>Conditions for course completion:</b><br>Get a prescribed minimum number of points for activities of continuous assessment and for solving tasks during final practical test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |
| <b>Brief outline of the course:</b><br>First part of the course (with turtle graphics): New Eclipse project, interactive communication with objects, simple turtle graphics, making user methods, local variables, variable types, arithmetic and logical expressions, random numbers, conditions, loops for and while, debugging, references, chars, Strings, arrays, instance variables, mouse events, simple array algorithms.<br>Second part of the course (without turtle graphics): Exceptions, using try-catch-finally block, files and directories, conversion from string variables, encapsulation, constructors with parameters, constructors hierarchy, getters and setters, interfaces, inheritance and polymorphism, abstract classes and methods, packages, visibility modifiers, sorting using Arrays.sort() and interfaces Comparable and Comparator, Java Collections Framework: autoboxing, interface List, ArrayList, LinkedList, interface Set and class HashSet, methods equals() and hashCode(), for-each loop, interface Map and class HashMap, custom Exceptions, rethrowing exceptions, exceptions' inheritance, Runtime exceptions, Errors, static variables and methods. |                                                             |
| <b>Recommended literature:</b><br>1. ECKEL, B.: Thinking in Java, Pearson, 2006, ISBN: 978-01-318-7248-6<br>2. PECINOVSKÝ, R.: OOP - Naučte se myslet a programovat objektově, Computer Press, a.s., Brno, 2010, ISBN: 978-80-251-2126-9<br>3. SIERRA, K., BATES, B. Head First Java, O'Reilly Media; 2nd edition, 2005, ISBN: 978-05-960-0920-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Course language:</b><br>Slovak language, english language is required only to read Java API documentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |

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| <b>Course assessment</b>                                                                                                                                                             |      |       |       |       |       |
| Total number of assessed students: 665                                                                                                                                               |      |       |       |       |       |
| A                                                                                                                                                                                    | B    | C     | D     | E     | FX    |
| 16.39                                                                                                                                                                                | 7.52 | 11.43 | 15.49 | 14.59 | 34.59 |
| <b>Provides:</b> RNDr. František Galčík, PhD., RNDr. Matej Nikorovič, PhD., RNDr. Ľubomír Antoni, PhD., RNDr. Zuzana Bednářová, PhD., RNDr. Miroslav Opiela, RNDr. Juraj Šebej, PhD. |      |       |       |       |       |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                         |      |       |       |       |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                              |      |       |       |       |       |

## COURSE INFORMATION LETTER

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                             |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Course ID:</b> ÚINF/<br>PAZ1b/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Course name:</b> Programming, algorithms, and complexity |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 4 <b>Per study period:</b> 28 / 56<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |
| <b>Number of ECTS credits:</b> 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                             |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                             |
| <b>Prerequisites:</b> ÚINF/PAZ1a/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |
| <b>Conditions for course completion:</b><br>Get a given minimum number of points for activities of continuous assessment and for solving tasks during final practical test. The final practical test focuses on application of known algorithms and techniques of efficient algorithm design.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                             |
| <b>Brief outline of the course:</b><br>Recursion and its applications, fractals. Binary search and simple sorting algorithm with quadratic time complexity. Time and space complexity of algorithms, analysis of time complexity, O-notation. Basic data structures and their applications: linked list, stack, and queue. Hierarchical data and their representation, trees, tree traversals, binary search trees. Arithmetic expressions, evaluation of an arithmetic expression. Efficient sorting algorithm: QuickSort, MergeSort, and HeapSort. Backtrack. Techniques “divide and conquer” and dynamic programming as methods for design of efficient algorithms. Basic graph algorithms for unweighted graphs (Breadth-first search, Depth-first search, graph connectivity, graph components, graph bridges, topological sort) and for weighted graphs (shortest paths: Bellman-Ford algorithm, Dijkstra algorithm, Floyd-Warshall algorithm; minimum spanning tree: Prim algorithm, Kruskal algorithm). String algorithms. Greedy algorithms. |                                                             |
| <b>Recommended literature:</b><br>WRÓBLEWSKI, P.: Algoritmy, datové struktury a programovací techniky. Computer Press, Brno, 2004<br>CORMEN, T.H., LEISERSON, Ch.E., RIVEST, R.L., STEIN, C. Introduction to Algorithms. The MIT Press, 2009.<br>KLEINBERG, J., TARDOS, E.: Algorithm Design, Cornell University, Addison Wesley, New York, 2006.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                             |
| <b>Course language:</b><br>Slovak language, literature is available in english and czech language.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |

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|--------------------------------------------------------------------------------------------------------------|------|------|-------|-------|-------|
| <b>Course assessment</b>                                                                                     |      |      |       |       |       |
| Total number of assessed students: 1142                                                                      |      |      |       |       |       |
| A                                                                                                            | B    | C    | D     | E     | FX    |
| 12.17                                                                                                        | 6.48 | 9.28 | 20.05 | 22.85 | 29.16 |
| <b>Provides:</b> doc. RNDr. Gabriela Andrejková, CSc., RNDr. František Galčík, PhD., PaedDr. Ján Guniš, PhD. |      |      |       |       |       |
| <b>Date of last modification:</b> 03.05.2015                                                                 |      |      |       |       |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                      |      |      |       |       |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |
| <b>Course ID:</b> ÚINF/<br>PAZ1c/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Course name:</b> Programming, algorithms, and complexity |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 4 <b>Per study period:</b> 56<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |
| <b>Learning outcomes:</b><br>Gain skills to design and implement complex application with three-layer architecture and well-known design patterns.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |
| <b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Food vending machine as an example of small project. Class identification. Use-cases. Method and instance variable identification. Unit testing in JUnit.</li> <li>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.</li> <li>3. Business logics in classes. Designing a simple layered application. Class relationships with static association. Pros and cons in hardwired associations.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>7. Associations between classes. Cardinalities: 1:1, 1:M, 1:N. Design and realization in the code.</li> <li>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.</li> <li>9. Service classes: two design approaches. Configuration vs input parameters.</li> <li>10. Database access with Spring JDBC Template. Mapping objects and relationships.</li> </ol> |                                                             |
| <b>Recommended literature:</b><br>SIERRA, K., BATES, B.: Head First Java (2nd Edition), 2005<br>ECKEL, B.: Thinking in Java (4th Edition), 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |

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|-----------------------------------------------------------------------------------------|------|-------|-------|-------|------|
| <b>Course language:</b>                                                                 |      |       |       |       |      |
| <b>Notes:</b>                                                                           |      |       |       |       |      |
| <b>Course assessment</b>                                                                |      |       |       |       |      |
| Total number of assessed students: 282                                                  |      |       |       |       |      |
| A                                                                                       | B    | C     | D     | E     | FX   |
| 35.11                                                                                   | 19.5 | 15.96 | 13.83 | 10.64 | 4.96 |
| <b>Provides:</b> RNDr. Róbert Novotný, PhD., RNDr. Peter Gurský, PhD.                   |      |       |       |       |      |
| <b>Date of last modification:</b> 19.01.2017                                            |      |       |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |      |       |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                  |       |                                |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                     |       |                                |       |       |      |
| <b>Course ID:</b><br>KPPaPZ/Ps/15                                                                                                                                                                      |       | <b>Course name:</b> Psychology |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                |       |       |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                       |       |                                |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 1., 3., 5.                                                                                                                                        |       |                                |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                |       |                                |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                  |       |                                |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                               |       |                                |       |       |      |
| <b>Learning outcomes:</b>                                                                                                                                                                              |       |                                |       |       |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                    |       |                                |       |       |      |
| <b>Recommended literature:</b>                                                                                                                                                                         |       |                                |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                |       |                                |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                          |       |                                |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 402                                                                                                                                     |       |                                |       |       |      |
| A                                                                                                                                                                                                      | B     | C                              | D     | E     | FX   |
| 16.67                                                                                                                                                                                                  | 13.18 | 22.64                          | 21.89 | 21.89 | 3.73 |
| <b>Provides:</b> prof. PhDr. Oľga Orosová, CSc., PhDr. Anna Janovská, PhD., Mgr. Jozef Benka, PhD. et PhD.                                                                                             |       |                                |       |       |      |
| <b>Date of last modification:</b> 18.03.2019                                                                                                                                                           |       |                                |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                |       |                                |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                                 |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                                 |      |      |      |
| <b>Course ID:</b><br>KPPaPZ/PKŽ/15                                                                                                                                                                      |       | <b>Course name:</b> Psychology of Everyday Life |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                                 |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                                 |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                 |       |                                                 |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                                 |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                                 |      |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                                 |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                                 |      |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                                 |      |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                                 |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                                 |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                                 |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 146                                                                                                                                      |       |                                                 |      |      |      |
| A                                                                                                                                                                                                       | B     | C                                               | D    | E    | FX   |
| 54.11                                                                                                                                                                                                   | 11.64 | 24.66                                           | 6.85 | 2.05 | 0.68 |
| <b>Provides:</b> Mgr. Ondrej Kalina, PhD.                                                                                                                                                               |       |                                                 |      |      |      |
| <b>Date of last modification:</b> 18.03.2019                                                                                                                                                            |       |                                                 |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                                 |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                                           |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                                           |      |      |      |
| <b>Course ID:</b> KPE/<br>OLŠ/15                                                                                                                                                                        |       | <b>Course name:</b> School Administration and Legislation |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                                           |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                                           |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                                             |       |                                                           |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                                           |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                                           |      |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                                           |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                                           |      |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                                           |      |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                                           |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                                           |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                                           |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 208                                                                                                                                      |       |                                                           |      |      |      |
| A                                                                                                                                                                                                       | B     | C                                                         | D    | E    | FX   |
| 40.38                                                                                                                                                                                                   | 27.88 | 18.75                                                     | 8.65 | 3.37 | 0.96 |
| <b>Provides:</b> Mgr. Zuzana Boberová, PhD.                                                                                                                                                             |       |                                                           |      |      |      |
| <b>Date of last modification:</b> 17.09.2019                                                                                                                                                            |       |                                                           |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                                           |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              |
| <b>Course ID:</b> ÚTVŠ/<br>ÚTVŠ/CM/13                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Course name:</b> Seaside Aerobic Exercise |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b> 36s<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                         |                                              |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                              |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                              |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |
| <b>Conditions for course completion:</b><br>Conditions for course completion:<br>Attendance                                                                                                                                                                                                                                                                                                                                                                                                             |                                              |
| <b>Learning outcomes:</b><br>Learning outcomes:<br>Students will be provided an overview of possibilities how to spend leisure time in seaside conditions actively and their skills in work and communication with clients will be improved. Students will acquire practical experience in organising the cultural and art-oriented events, with the aim to improve the stay and to create positive experiences for visitors.                                                                           |                                              |
| <b>Brief outline of the course:</b><br>Brief outline of the course:<br>1. Basics of seaside aerobics<br>2. Morning exercises<br>3. Pilates and its application in seaside conditions<br>4. Exercises for the spine<br>5. Yoga basics<br>6. Sport as a part of leisure time<br>7. Application of projects of productive spending of leisure time for different age and social groups (children, young people, elderly)<br>8. Application of seaside cultural and art-oriented activities in leisure time |                                              |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                              |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                              |
| <b>Course assessment</b><br>Total number of assessed students: 42                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                              |
| abs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | n                                            |
| 11.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 88.1                                         |

|                                                                                         |
|-----------------------------------------------------------------------------------------|
| <b>Provides:</b> Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD.                      |
| <b>Date of last modification:</b> 15.03.2019                                            |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |

## COURSE INFORMATION LETTER

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------|-----|-----|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |     |                                                                                       |     |     |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |     |                                                                                       |     |     |     |
| <b>Course ID:</b> KFaDF/VKFV/07                                                                                                                                                    |     | <b>Course name:</b> Selected Topics in Philosophy of Education (General Introduction) |     |     |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |     |                                                                                       |     |     |     |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                   |     |                                                                                       |     |     |     |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                        |     |                                                                                       |     |     |     |
| <b>Course level:</b> I.                                                                                                                                                            |     |                                                                                       |     |     |     |
| <b>Prerequisites:</b> KFaDF/DF1/05                                                                                                                                                 |     |                                                                                       |     |     |     |
| <b>Conditions for course completion:</b>                                                                                                                                           |     |                                                                                       |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                          |     |                                                                                       |     |     |     |
| <b>Brief outline of the course:</b>                                                                                                                                                |     |                                                                                       |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                     |     |                                                                                       |     |     |     |
| <b>Course language:</b>                                                                                                                                                            |     |                                                                                       |     |     |     |
| <b>Notes:</b>                                                                                                                                                                      |     |                                                                                       |     |     |     |
| <b>Course assessment</b><br>Total number of assessed students: 0                                                                                                                   |     |                                                                                       |     |     |     |
| A                                                                                                                                                                                  | B   | C                                                                                     | D   | E   | FX  |
| 0.0                                                                                                                                                                                | 0.0 | 0.0                                                                                   | 0.0 | 0.0 | 0.0 |
| <b>Provides:</b> doc. PhDr. Pavol Tholt, PhD., mim. prof.                                                                                                                          |     |                                                                                       |     |     |     |
| <b>Date of last modification:</b>                                                                                                                                                  |     |                                                                                       |     |     |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                            |     |                                                                                       |     |     |     |

## COURSE INFORMATION LETTER

|                                                                                                                                                                                                                           |       |                                            |       |       |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------|-------|-------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                     |       |                                            |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                        |       |                                            |       |       |      |
| <b>Course ID:</b> ÚINF/BSI1a/15                                                                                                                                                                                           |       | <b>Course name:</b> Seminar in informatics |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                   |       |                                            |       |       |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                          |       |                                            |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 5.                                                                                                                                                                   |       |                                            |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                   |       |                                            |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                     |       |                                            |       |       |      |
| <b>Conditions for course completion:</b><br>Presentation of algorithms for problems of a higher complexity. Presentation of results connecting to the bachelor theses, known and own results.                             |       |                                            |       |       |      |
| <b>Learning outcomes:</b><br>To inform students about new results in informatics with the goal using them in bachelor theses.                                                                                             |       |                                            |       |       |      |
| <b>Brief outline of the course:</b><br>The seminar has a connection to the bachelor theses and to the repetitorium in informatics. Students present results of their work once in semester at least.                      |       |                                            |       |       |      |
| <b>Recommended literature:</b><br>Sources of problems:<br><a href="http://www.ksp.sk">www.ksp.sk</a><br><a href="http://www.ksp.sk/MOP/">www.ksp.sk/MOP/</a><br>Special research literature according to bachelor theses. |       |                                            |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                   |       |                                            |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                             |       |                                            |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 214                                                                                                                                                        |       |                                            |       |       |      |
| A                                                                                                                                                                                                                         | B     | C                                          | D     | E     | FX   |
| 21.5                                                                                                                                                                                                                      | 18.22 | 24.3                                       | 17.29 | 16.82 | 1.87 |
| <b>Provides:</b> doc. RNDr. Gabriela Andrejková, CSc.                                                                                                                                                                     |       |                                            |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                              |       |                                            |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                   |       |                                            |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                         |       |                                            |       |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                            |       |                                            |       |      |      |
| <b>Course ID:</b> ÚINF/BSI1b/15                                                                                                                                                                                                                                                               |       | <b>Course name:</b> Seminar in informatics |       |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                       |       |                                            |       |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                              |       |                                            |       |      |      |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                       |       |                                            |       |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                       |       |                                            |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                         |       |                                            |       |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                      |       |                                            |       |      |      |
| <b>Learning outcomes:</b><br>To inform students about new results in informatics with the goal using them in bachelor theses.<br>To repeat important knowledges in informatics.                                                                                                               |       |                                            |       |      |      |
| <b>Brief outline of the course:</b><br>The seminar has a connection to the bachelor theses and to the repetitorium in informatics. Students present results of their work once in semester at least. To get credits, it is necessary to get the developed number of points from repetitorium. |       |                                            |       |      |      |
| <b>Recommended literature:</b><br>Sources of problems:<br><a href="http://www.ksp.sk">www.ksp.sk</a><br><a href="http://www.ksp.sk/MOP/">www.ksp.sk/MOP/</a><br>Special research literature according to bachelor theses.                                                                     |       |                                            |       |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                       |       |                                            |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                 |       |                                            |       |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 127                                                                                                                                                                                                                            |       |                                            |       |      |      |
| A                                                                                                                                                                                                                                                                                             | B     | C                                          | D     | E    | FX   |
| 26.77                                                                                                                                                                                                                                                                                         | 21.26 | 25.98                                      | 14.96 | 9.45 | 1.57 |
| <b>Provides:</b> doc. RNDr. Gabriela Andrejková, CSc.                                                                                                                                                                                                                                         |       |                                            |       |      |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                  |       |                                            |       |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                       |       |                                            |       |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |
| <b>Course ID:</b> ÚCHV/<br>ASM/03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Course name:</b> Separation Methods |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                        |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                        |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |
| <b>Prerequisites:</b> (ÚCHV/ANCHU/03 or ÚCHV/ANCHE/09 or ÚCHV/ANCH1b/03) and (ÚCHV/PAEC/03 or ÚCHV/PANCH/06 or ÚCHV/PANCHE/09 or ÚCHV/PACU/03)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                        |
| <b>Conditions for course completion:</b><br>Examination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |
| <b>Learning outcomes:</b><br>Survey of basic principles, theoretical background and applications of separation methods in research and analytical practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |
| <b>Brief outline of the course:</b><br>Basic principles, classification, theory and applications of separation methods. Extraction - LLE, SPE, SPME. Chromatographic methods - theory, classification. Gas chromatography, retention mechanisms, stationary phases and their selection. Instrumentation, detectors in GC. Data evaluation - qualitative and quantitative analysis. High-performance liquid chromatography, principles, classification. Stationary and mobile phases in LC, instrumentation. Applications. Comparison of GC and HPLC methods.<br>Planar chromatographic methods - TLC, HPTLC, PC.<br>Electrophoretic techniques - CE, ITP, HPCE. MEKC - micellar electrokinetic capillary chromatography. Lab-on-a-Chip (LOC), TAS, electrophoresis on a chip, principles and applications. |                                        |
| <b>Recommended literature:</b><br>Krupčík, J.: Separačné metódy, SVŠT CHTF, Bratislava 1983.<br>Skoog D. A., Leary J. J.: Principles of instrumental analysis. Saunders College Publishing, New York 1997.<br>Pawliszyn J., Lord H. L.: Handbook of sample preparation, Wiley 2010.<br>Churáček J., Jandera P.: Úvod do vysokoúčinné kapalinové chromatografie, SNTL, Praha 1984.                                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |

|                                                                                         |       |       |       |      |      |
|-----------------------------------------------------------------------------------------|-------|-------|-------|------|------|
| <b>Course assessment</b>                                                                |       |       |       |      |      |
| Total number of assessed students: 443                                                  |       |       |       |      |      |
| A                                                                                       | B     | C     | D     | E    | FX   |
| 27.77                                                                                   | 24.83 | 25.96 | 12.87 | 6.09 | 2.48 |
| <b>Provides:</b> doc. RNDr. Taťána Gondová, CSc.                                        |       |       |       |      |      |
| <b>Date of last modification:</b> 03.02.2020                                            |       |       |       |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |       |       |      |      |

## COURSE INFORMATION LETTER

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------|-------|------|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                  |     |                                                               |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                     |     |                                                               |       |      |     |
| <b>Course ID:</b> KPO/SPKV/15                                                                                                                                                                          |     | <b>Course name:</b> Social and Political Context of Education |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |     |                                                               |       |      |     |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                       |     |                                                               |       |      |     |
| <b>Recommended semester/trimester of the course:</b> 4., 6.                                                                                                                                            |     |                                                               |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                |     |                                                               |       |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                  |     |                                                               |       |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                                               |     |                                                               |       |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                              |     |                                                               |       |      |     |
| <b>Brief outline of the course:</b>                                                                                                                                                                    |     |                                                               |       |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                         |     |                                                               |       |      |     |
| <b>Course language:</b>                                                                                                                                                                                |     |                                                               |       |      |     |
| <b>Notes:</b>                                                                                                                                                                                          |     |                                                               |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 19                                                                                                                                      |     |                                                               |       |      |     |
| A                                                                                                                                                                                                      | B   | C                                                             | D     | E    | FX  |
| 42.11                                                                                                                                                                                                  | 0.0 | 26.32                                                         | 26.32 | 5.26 | 0.0 |
| <b>Provides:</b> Dr.h.c. prof. PhDr. Marcela Gbúrová, CSc.                                                                                                                                             |     |                                                               |       |      |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                           |     |                                                               |       |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                |     |                                                               |       |      |     |

## COURSE INFORMATION LETTER

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------|-------|-------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                        |       |                                          |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                           |       |                                          |       |       |      |
| <b>Course ID:</b> ÚINF/SWI1a/15                                                                                                                                                                                                                                                              |       | <b>Course name:</b> Software engineering |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                      |       |                                          |       |       |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                             |       |                                          |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                      |       |                                          |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                      |       |                                          |       |       |      |
| <b>Prerequisites:</b> ÚINF/DBS1a/15 or ÚINF/DBdi/15                                                                                                                                                                                                                                          |       |                                          |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                     |       |                                          |       |       |      |
| <b>Learning outcomes:</b><br>To provide information concerning the principal activities related to the development of software products.                                                                                                                                                     |       |                                          |       |       |      |
| <b>Brief outline of the course:</b><br>System, subsystem, software system. Software processes. Introduction to project management. Requirements gathering. Software modelilng. Software architectures. Software development methodologies. Verification and validation. Resource management. |       |                                          |       |       |      |
| <b>Recommended literature:</b><br>1. BERKUN, S. The Art Of Project Management. O Reilly, 2005.<br>2. BJORNER, D. Software engineering 1,2,3. Springer-Verlag Berlin, 2006.<br>3. SOMMERVILLE, I. Software Engineering. Addison-Wesley, 2007.                                                 |       |                                          |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                      |       |                                          |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                |       |                                          |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 279                                                                                                                                                                                                                           |       |                                          |       |       |      |
| A                                                                                                                                                                                                                                                                                            | B     | C                                        | D     | E     | FX   |
| 16.49                                                                                                                                                                                                                                                                                        | 20.43 | 20.07                                    | 19.35 | 22.22 | 1.43 |
| <b>Provides:</b> prof. RNDr. Gabriel Semanišin, PhD., Mgr. Alexander Szabari, PhD.                                                                                                                                                                                                           |       |                                          |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                 |       |                                          |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                      |       |                                          |       |       |      |

## COURSE INFORMATION LETTER

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------|-------|------|------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                                                      |       |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                                                      |       |      |      |
| <b>Course ID:</b> KGER/OJPV1/07                                                                                                                                                                         |       | <b>Course name:</b> Specialised German Language - Natural Sciences 1 |       |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                                                      |       |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                                                      |       |      |      |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                 |       |                                                                      |       |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                                                      |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                                                      |       |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                                                      |       |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                                                      |       |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                                                      |       |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                                                      |       |      |      |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                                                      |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                                                      |       |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 139                                                                                                                                      |       |                                                                      |       |      |      |
| A                                                                                                                                                                                                       | B     | C                                                                    | D     | E    | FX   |
| 22.3                                                                                                                                                                                                    | 23.02 | 24.46                                                                | 21.58 | 7.91 | 0.72 |
| <b>Provides:</b> Mgr. Andreas Schiestl                                                                                                                                                                  |       |                                                                      |       |      |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                            |       |                                                                      |       |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                                                      |       |      |      |

## COURSE INFORMATION LETTER

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |
| <b>Course ID:</b> ÚTVŠ/<br>TVa/11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Course name:</b> Sports Activities I. |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: 2 Per study period: 28</b><br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |
| <b>Course level:</b> I., I.II., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |
| <b>Conditions for course completion:</b><br>Conditions for course completion:<br>Min. 80% of active participation in classes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          |
| <b>Learning outcomes:</b><br>Learning outcomes:<br>Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |
| <b>Brief outline of the course:</b><br>Brief outline of the course:<br>Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.<br>In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitnes.<br>In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation. |                                          |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          |

|                                                                                                                                                                                                                                                                                                                                                        |       |       |       |       |       |      |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|------|-------|
| <b>Course assessment</b>                                                                                                                                                                                                                                                                                                                               |       |       |       |       |       |      |       |
| Total number of assessed students: 12947                                                                                                                                                                                                                                                                                                               |       |       |       |       |       |      |       |
| abs                                                                                                                                                                                                                                                                                                                                                    | abs-A | abs-B | abs-C | abs-D | abs-E | n    | neabs |
| 88.64                                                                                                                                                                                                                                                                                                                                                  | 0.06  | 0.0   | 0.0   | 0.0   | 0.03  | 7.22 | 4.05  |
| <b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., Mgr. Peter Bakalár, PhD.,<br>doc. PaedDr. Ivan Uher, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr.<br>Stanislav Vokál, DrSc., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD.,<br>Mgr. Marcel Čurgali, PaedDr. Jana Potočnicková, PhD. |       |       |       |       |       |      |       |
| <b>Date of last modification:</b> 18.03.2019                                                                                                                                                                                                                                                                                                           |       |       |       |       |       |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                                |       |       |       |       |       |      |       |

## COURSE INFORMATION LETTER

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |
| <b>Course ID:</b> ÚTVŠ/<br>TVb/11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Course name:</b> Sports Activities II. |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: 2 Per study period: 28</b><br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |
| <b>Recommended semester/trimester of the course:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                           |
| <b>Course level:</b> I., I.II., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                           |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |
| <b>Conditions for course completion:</b><br>Conditions for course completion:<br>Final assessment and active participation in classes - min. 75%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                           |
| <b>Learning outcomes:</b><br>Learning outcomes:<br>Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |
| <b>Brief outline of the course:</b><br>Brief outline of the course:<br>Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.<br>In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitnes.<br>In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation. |                                           |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                           |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                           |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |

| <b>Course assessment</b>                                                                                                                                                                                                                                                                                                                      |       |       |       |       |       |      |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|------|-------|
| Total number of assessed students: 11186                                                                                                                                                                                                                                                                                                      |       |       |       |       |       |      |       |
| abs                                                                                                                                                                                                                                                                                                                                           | abs-A | abs-B | abs-C | abs-D | abs-E | n    | neabs |
| 85.58                                                                                                                                                                                                                                                                                                                                         | 0.55  | 0.02  | 0.0   | 0.0   | 0.05  | 9.99 | 3.8   |
| <b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Peter Bakalár, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočnicková, PhD. |       |       |       |       |       |      |       |
| <b>Date of last modification:</b> 18.03.2019                                                                                                                                                                                                                                                                                                  |       |       |       |       |       |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                       |       |       |       |       |       |      |       |

## COURSE INFORMATION LETTER

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------|-------|-------|-------|------|-------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                         |       |                                            |       |       |       |      |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                            |       |                                            |       |       |       |      |       |
| <b>Course ID:</b> ÚTVŠ/<br>TVc/11                                                                                                                                                                                                                                                                                                             |       | <b>Course name:</b> Sports Activities III. |       |       |       |      |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                       |       |                                            |       |       |       |      |       |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                              |       |                                            |       |       |       |      |       |
| <b>Recommended semester/trimester of the course:</b> 3.                                                                                                                                                                                                                                                                                       |       |                                            |       |       |       |      |       |
| <b>Course level:</b> I., I.II., II.                                                                                                                                                                                                                                                                                                           |       |                                            |       |       |       |      |       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                         |       |                                            |       |       |       |      |       |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                      |       |                                            |       |       |       |      |       |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                     |       |                                            |       |       |       |      |       |
| <b>Brief outline of the course:</b>                                                                                                                                                                                                                                                                                                           |       |                                            |       |       |       |      |       |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                |       |                                            |       |       |       |      |       |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                       |       |                                            |       |       |       |      |       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                 |       |                                            |       |       |       |      |       |
| <b>Course assessment</b><br>Total number of assessed students: 7741                                                                                                                                                                                                                                                                           |       |                                            |       |       |       |      |       |
| abs                                                                                                                                                                                                                                                                                                                                           | abs-A | abs-B                                      | abs-C | abs-D | abs-E | n    | neabs |
| 90.03                                                                                                                                                                                                                                                                                                                                         | 0.04  | 0.01                                       | 0.0   | 0.0   | 0.03  | 4.04 | 5.85  |
| <b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Peter Bakalár, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočnicková, PhD. |       |                                            |       |       |       |      |       |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                  |       |                                            |       |       |       |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                       |       |                                            |       |       |       |      |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                              |       |                                           |       |       |       |      |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                 |       |                                           |       |       |       |      |       |
| <b>Course ID:</b> ÚTVŠ/<br>TVd/11                                                                                                                                                                                                                                                                                                                                                  |       | <b>Course name:</b> Sports Activities IV. |       |       |       |      |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                                                            |       |                                           |       |       |       |      |       |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                   |       |                                           |       |       |       |      |       |
| <b>Recommended semester/trimester of the course:</b> 4.                                                                                                                                                                                                                                                                                                                            |       |                                           |       |       |       |      |       |
| <b>Course level:</b> I., I.II., II.                                                                                                                                                                                                                                                                                                                                                |       |                                           |       |       |       |      |       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                              |       |                                           |       |       |       |      |       |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                           |       |                                           |       |       |       |      |       |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                          |       |                                           |       |       |       |      |       |
| <b>Brief outline of the course:</b>                                                                                                                                                                                                                                                                                                                                                |       |                                           |       |       |       |      |       |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                     |       |                                           |       |       |       |      |       |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                            |       |                                           |       |       |       |      |       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                      |       |                                           |       |       |       |      |       |
| <b>Course assessment</b><br>Total number of assessed students: 5086                                                                                                                                                                                                                                                                                                                |       |                                           |       |       |       |      |       |
| abs                                                                                                                                                                                                                                                                                                                                                                                | abs-A | abs-B                                     | abs-C | abs-D | abs-E | n    | neabs |
| 85.19                                                                                                                                                                                                                                                                                                                                                                              | 0.29  | 0.04                                      | 0.0   | 0.0   | 0.0   | 6.78 | 7.69  |
| <b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., Mgr. Peter Bakalár, PhD.,<br>doc. PaedDr. Ivan Uher, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr.<br>Stanislav Vokál, DrSc., Mgr. Lucia Kršňáková, PhD., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD.,<br>Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočnicková, PhD. |       |                                           |       |       |       |      |       |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                       |       |                                           |       |       |       |      |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                                                            |       |                                           |       |       |       |      |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                           |       |                                                                     |       |      |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                              |       |                                                                     |       |      |     |
| <b>Course ID:</b> ÚCHV/MUSU/15                                                                                                                                                                                                                                                                                                                  |       | <b>Course name:</b> Structure determination - spectroscopic methods |       |      |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 3 <b>Per study period:</b> 28 / 42<br><b>Course method:</b> present                                                                                                                      |       |                                                                     |       |      |     |
| <b>Number of ECTS credits:</b> 7                                                                                                                                                                                                                                                                                                                |       |                                                                     |       |      |     |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                                                                         |       |                                                                     |       |      |     |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                         |       |                                                                     |       |      |     |
| <b>Prerequisites:</b> ÚCHV/ACHU/03 and ÚCHV/ANCHU/03 and ÚCHV/OCHU/03                                                                                                                                                                                                                                                                           |       |                                                                     |       |      |     |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                        |       |                                                                     |       |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                       |       |                                                                     |       |      |     |
| <b>Brief outline of the course:</b><br>Fundamentals of molecular spectroscopy and magnetic properties study, as powerful tools for structure determination in chemistry. Those are ultraviolet, visible, infrared and Raman spectroscopy, mass spectrometry and methods based on magnetic resonance ( <sup>1</sup> H NMR, <sup>13</sup> C NMR). |       |                                                                     |       |      |     |
| <b>Recommended literature:</b><br>L.G.Wade,Jr.: Organic Chemistry. Prentice Hall International, Inc. Englewood Cliffs, New Yersey 1995.                                                                                                                                                                                                         |       |                                                                     |       |      |     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                         |       |                                                                     |       |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                   |       |                                                                     |       |      |     |
| <b>Course assessment</b><br>Total number of assessed students: 123                                                                                                                                                                                                                                                                              |       |                                                                     |       |      |     |
| A                                                                                                                                                                                                                                                                                                                                               | B     | C                                                                   | D     | E    | FX  |
| 15.45                                                                                                                                                                                                                                                                                                                                           | 34.96 | 28.46                                                               | 17.89 | 3.25 | 0.0 |
| <b>Provides:</b> doc. RNDr. Ján Imrich, CSc., RNDr. Monika Tvrdoňová, PhD., doc. RNDr. Juraj Kuchár, PhD.                                                                                                                                                                                                                                       |       |                                                                     |       |      |     |
| <b>Date of last modification:</b> 04.02.2020                                                                                                                                                                                                                                                                                                    |       |                                                                     |       |      |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                                                                                                                                                         |       |                                                                     |       |      |     |

## COURSE INFORMATION LETTER

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------|-----|-----|-----|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                              |     |                                                                   |     |     |     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                 |     |                                                                   |     |     |     |
| <b>Course ID:</b> ÚCHV/<br>SVK/00                                                                                                                                                  |     | <b>Course name:</b> Students Scientific Conference (Presentation) |     |     |     |
| <b>Course type, scope and the method:</b><br><b>Course type:</b><br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b><br><b>Course method:</b> present |     |                                                                   |     |     |     |
| <b>Number of ECTS credits:</b> 4                                                                                                                                                   |     |                                                                   |     |     |     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                               |     |                                                                   |     |     |     |
| <b>Course level:</b> I., II.                                                                                                                                                       |     |                                                                   |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                              |     |                                                                   |     |     |     |
| <b>Conditions for course completion:</b>                                                                                                                                           |     |                                                                   |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                          |     |                                                                   |     |     |     |
| <b>Brief outline of the course:</b>                                                                                                                                                |     |                                                                   |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                     |     |                                                                   |     |     |     |
| <b>Course language:</b>                                                                                                                                                            |     |                                                                   |     |     |     |
| <b>Notes:</b>                                                                                                                                                                      |     |                                                                   |     |     |     |
| <b>Course assessment</b><br>Total number of assessed students: 35                                                                                                                  |     |                                                                   |     |     |     |
| A                                                                                                                                                                                  | B   | C                                                                 | D   | E   | FX  |
| 100.0                                                                                                                                                                              | 0.0 | 0.0                                                               | 0.0 | 0.0 | 0.0 |
| <b>Provides:</b>                                                                                                                                                                   |     |                                                                   |     |     |     |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                       |     |                                                                   |     |     |     |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                            |     |                                                                   |     |     |     |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                |
| <b>Course ID:</b> ÚMV/<br>DGS/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Course name:</b> Students' Digital Literacy |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |
| <b>Recommended semester/trimester of the course:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |
| <b>Conditions for course completion:</b><br>continuous assessment and final project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                |
| <b>Learning outcomes:</b><br>To acquire an overview of the current possibilities of digital technology to develop skills and competencies with emphasis on the area of communication, social interaction and personal. To acquire basic digital skills for working with advanced technologies (mobile phone, tablet, laptop, social media, online webtechnologies). To understand the value of existing advanced technologies for better and more effective learning, work and active life in higher education, lifelong learning and further career prospects.                                                                                                                                                                                  |                                                |
| <b>Brief outline of the course:</b><br>Introduction to the problems of current, commonly available digital technology. Tools for access to online information source (mobile applications for access to information systems, databases, data books). Tools for collecting, generating direct information and data and its subsequent analysis and visualization. Tools for providing and sharing of electronic content (cloud technology - Google Drive, Youtube, Google+, Skydrive, Dropbox). Tools for communication, discussion and collaborative activities. Legal work with digital technologies and resources, plagiarism, critical evaluation of digital resources. Security, privacy, digital ethics and etiquette, digital citizenship. |                                                |
| <b>Recommended literature:</b><br>1. Bruff, D. (2009). Teaching with classroom response systems: Creating active learning environments. San Francisco: Jossey-Bass.<br>2. Byrne, R. (2012). Google Drive and Docs for Teachers. Free Tech for Teachers.<br>3. Kawasaki, G. (2012). What the Plus! Google+ for the Rest of Us. Amazon igital Services.<br>4. Kolb, L. (2011). Cell Phones in the Classroom: A Practical Guide for Educators. International Society for Technology in Education.                                                                                                                                                                                                                                                   |                                                |
| <b>Course language:</b><br>Slovak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                |

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|------------------------------------------------------------------------------------------------------------------|------|
| <b>Course assessment</b>                                                                                         |      |
| Total number of assessed students: 195                                                                           |      |
| abs                                                                                                              | n    |
| 96.92                                                                                                            | 3.08 |
| <b>Provides:</b> doc. RNDr. Stanislav Lukáč, PhD., doc. RNDr. Jozef Hanč, PhD., doc. RNDr. Ľubomír Šnajder, PhD. |      |
| <b>Date of last modification:</b> 03.05.2015                                                                     |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                          |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                         |
| <b>Course ID:</b> ÚTVŠ/<br>LKSp/13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Course name:</b> Summer Course-Rafting of TISA River |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b> 36s<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                      |                                                         |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                         |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                         |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |
| <b>Conditions for course completion:</b><br>Conditions for course completion:<br>Attendance<br>Final assessment: Raft control on the waterway (attended/not attended)                                                                                                                                                                                                                                                                                                                                                                |                                                         |
| <b>Learning outcomes:</b><br>Learning outcomes:<br>Students have knowledge of rafts (canoe) and their control on waterway.                                                                                                                                                                                                                                                                                                                                                                                                           |                                                         |
| <b>Brief outline of the course:</b><br>Brief outline of the course:<br>1. Assessment of difficulty of waterways<br>2. Safety rules for rafting<br>3. Setting up a crew<br>4. Practical skills training using an empty canoe<br>5. Canoe lifting and carrying<br>6. Putting the canoe in the water without a shore contact<br>7. Getting in the canoe<br>8. Exiting the canoe<br>9. Taking the canoe out of the water<br>10. Steering<br>a) The pry stroke (on fast waterways)<br>b) The draw stroke<br>11. Capsizing<br>12. Commands |                                                         |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                         |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                         |

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|-----------------------------------------------------------------------------------------|-------|
| <b>Course assessment</b>                                                                |       |
| Total number of assessed students: 151                                                  |       |
| abs                                                                                     | n     |
| 45.03                                                                                   | 54.97 |
| <b>Provides:</b> Mgr. Peter Bakalár, PhD.                                               |       |
| <b>Date of last modification:</b> 18.03.2019                                            |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                     |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |
| <b>Course ID:</b> ÚTVŠ/<br>KP/12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Course name:</b> Survival Course |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week: Per study period:</b> 36s<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                  |                                     |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                     |
| <b>Course level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                     |
| <b>Conditions for course completion:</b><br>Conditions for course completion:<br>Attendance<br>Final assessment: continuous fulfilment of all tasks within the course                                                                                                                                                                                                                                                                                                                                                                            |                                     |
| <b>Learning outcomes:</b><br>Learning outcomes:<br>Students will be familiarized with principles of safe stay and movement in extreme natural conditions as they will obtain theoretical knowledge and practical skills to solve the extraordinary and demanding situations connected with survival and minimization of damage to health. The course develops team work and students will learn how to manage and face the situations that require overcoming of obstacles.                                                                      |                                     |
| <b>Brief outline of the course:</b><br>Brief outline of the course:<br>Lectures:<br>1. Principles of behaviour and safety for movement and stay in unknown mountains<br>2. Preparation and leadership of tour<br>3. Objective and subjective danger in mountains<br>4. Principles of hygiene and prevention of damage to health in extreme conditions<br>Exercises:<br>1. Movement in terrain, orientation and navigation in terrain (compasses, GPS)<br>2. Preparation of improvised overnight stay<br>3. Water treatment and food preparation. |                                     |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                     |

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|-----------------------------------------------------------------------------------------|-------|
| <b>Course assessment</b>                                                                |       |
| Total number of assessed students: 392                                                  |       |
| abs                                                                                     | n     |
| 44.39                                                                                   | 55.61 |
| <b>Provides:</b> Mgr. Marek Valanský, MUDr. Peter Dombrovský                            |       |
| <b>Date of last modification:</b> 15.03.2019                                            |       |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |       |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                      |     |                                    |       |       |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                         |     |                                    |       |       |      |
| <b>Course ID:</b> ÚINF/<br>SLO1a/15                                                                                                                                                                                                                                                                                                        |     | <b>Course name:</b> Symbolic logic |       |       |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Lecture / Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14<br><b>Course method:</b> present                                                                                                                 |     |                                    |       |       |      |
| <b>Number of ECTS credits:</b> 5                                                                                                                                                                                                                                                                                                           |     |                                    |       |       |      |
| <b>Recommended semester/trimester of the course:</b> 6.                                                                                                                                                                                                                                                                                    |     |                                    |       |       |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                    |     |                                    |       |       |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                      |     |                                    |       |       |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                   |     |                                    |       |       |      |
| <b>Learning outcomes:</b><br>To understand basic notions of sentence and predicate logic - sentence, sentence scheme, provability, satisfiability, term, formula.                                                                                                                                                                          |     |                                    |       |       |      |
| <b>Brief outline of the course:</b><br>Predicate logic – logic language, syntax and semantics, term, formula. Axioms, proof, provability. Interpretation, truth, model. Correctness of the predicate logic.                                                                                                                                |     |                                    |       |       |      |
| <b>Recommended literature:</b><br>GOLDSTERN M., JUDAH H.: The Incompleteness Phenomenon, A New Course in Mathematical Logic, A K Peters, Wellesley, Massachusetts, 1995<br><a href="http://cs.ics.upjs.sk/~krajci/skola/vyucba/ucebneTexty/logika/logika.pdf">http://cs.ics.upjs.sk/~krajci/skola/vyucba/ucebneTexty/logika/logika.pdf</a> |     |                                    |       |       |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                    |     |                                    |       |       |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                              |     |                                    |       |       |      |
| <b>Course assessment</b><br>Total number of assessed students: 394                                                                                                                                                                                                                                                                         |     |                                    |       |       |      |
| A                                                                                                                                                                                                                                                                                                                                          | B   | C                                  | D     | E     | FX   |
| 24.87                                                                                                                                                                                                                                                                                                                                      | 9.9 | 12.44                              | 11.68 | 27.92 | 13.2 |
| <b>Provides:</b> doc. RNDr. Stanislav Krajčí, PhD., RNDr. Ondrej Krídlo, PhD.                                                                                                                                                                                                                                                              |     |                                    |       |       |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                               |     |                                    |       |       |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                    |     |                                    |       |       |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                   |       |                                         |      |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                      |       |                                         |      |      |      |
| <b>Course ID:</b> KPE/TVE/08                                                                                                                                                                            |       | <b>Course name:</b> Theory of Education |      |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present |       |                                         |      |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                        |       |                                         |      |      |      |
| <b>Recommended semester/trimester of the course:</b> 4., 6.                                                                                                                                             |       |                                         |      |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                 |       |                                         |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                   |       |                                         |      |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                |       |                                         |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                               |       |                                         |      |      |      |
| <b>Brief outline of the course:</b>                                                                                                                                                                     |       |                                         |      |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                          |       |                                         |      |      |      |
| <b>Course language:</b>                                                                                                                                                                                 |       |                                         |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                           |       |                                         |      |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 429                                                                                                                                      |       |                                         |      |      |      |
| A                                                                                                                                                                                                       | B     | C                                       | D    | E    | FX   |
| 31.0                                                                                                                                                                                                    | 35.66 | 22.38                                   | 6.76 | 1.63 | 2.56 |
| <b>Provides:</b> Mgr. Zuzana Boberová, PhD., Mgr. Katarína Petříková, PhD.                                                                                                                              |       |                                         |      |      |      |
| <b>Date of last modification:</b> 20.03.2020                                                                                                                                                            |       |                                         |      |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                 |       |                                         |      |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                           |     |      |      |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |     |      |      |
| <b>Course ID:</b> ÚINF/TYS1/15                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       | <b>Course name:</b> Typographical systems |     |      |      |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 2 <b>Per study period:</b> 28<br><b>Course method:</b> present                                                                                                                                                                                                                                                                             |       |                                           |     |      |      |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                           |     |      |      |
| <b>Recommended semester/trimester of the course:</b> 4., 6.                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                           |     |      |      |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                           |     |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                           |     |      |      |
| <b>Conditions for course completion:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                           |     |      |      |
| <b>Learning outcomes:</b><br>To provide the basic information on principles for typesetting of documents containing mathematical formulas in Plain TeX, AMS-TeX, and LaTeX.                                                                                                                                                                                                                                                                                                         |       |                                           |     |      |      |
| <b>Brief outline of the course:</b><br>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. |       |                                           |     |      |      |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                           |     |      |      |
| <b>Course language:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                           |     |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                           |     |      |      |
| <b>Course assessment</b><br>Total number of assessed students: 246                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |     |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B     | C                                         | D   | E    | FX   |
| 47.97                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 18.29 | 19.51                                     | 6.5 | 6.91 | 0.81 |
| <b>Provides:</b> doc. RNDr. Stanislav Krajči, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                           |     |      |      |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                           |     |      |      |
| <b>Approved:</b> doc. RNDr. Stanislav Krajči, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.                                                                                                                                                                                                                                                                                                                                                                                             |       |                                           |     |      |      |

## COURSE INFORMATION LETTER

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| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                               |       |       |       |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                               |       |       |       |
| <b>Course ID:</b> ÚINF/WBdi/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       | <b>Course name:</b> Web and a development of user environment |       |       |       |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 3 <b>Per study period:</b> 42<br><b>Course method:</b> present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                               |       |       |       |
| <b>Number of ECTS credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                               |       |       |       |
| <b>Recommended semester/trimester of the course:</b> 3., 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                               |       |       |       |
| <b>Course level:</b> I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                               |       |       |       |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                               |       |       |       |
| <b>Conditions for course completion:</b><br>Solving partial assignments and active participation in discussions in a virtual classroom. The course is realized in distance form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                               |       |       |       |
| <b>Learning outcomes:</b><br>Create accessible and usable Web Sites, used the standards (X) HTML and CSS.<br>Apply the rules for the page layout.<br>Maintain website and use the basic procedures for their promotion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                               |       |       |       |
| <b>Brief outline of the course:</b><br>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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                               |       |       |       |
| <b>Recommended literature:</b><br>Basic sources for distance courses will be published in LMS Moodle.<br>TITTEL, Ed a Jeff NOBLE. HTML, XHTML & CSS. 7th ed. Hoboken, NJ: Wiley, c2011, xx, 392 p. --For dummies. ISBN 04-709-1659-1.<br>KRUG, Steve. <i>Nenuťte užívateľa premýšľať!</i>: praktický průvodce testováním a opravou chyb použitelnost webu</i>. 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: <i>312/2010</i>. 2010. Dostupné z: <a href="http://informatizacia.sk/ext_dok-vynos_a_prilohy_2010-312/7431c">http://informatizacia.sk/ext_dok-vynos_a_prilohy_2010-312/7431c</a> |       |                                                               |       |       |       |
| <b>Course language:</b><br>slovak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                               |       |       |       |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                               |       |       |       |
| <b>Course assessment</b><br>Total number of assessed students: 95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                               |       |       |       |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | B     | C                                                             | D     | E     | FX    |
| 13.68                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 10.53 | 9.47                                                          | 18.95 | 24.21 | 23.16 |
| <b>Provides:</b> doc. RNDr. Ľubomír Šnajder, PhD., PaedDr. Ján Guniš, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                               |       |       |       |

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|-----------------------------------------------------------------------------------------|
| <b>Date of last modification:</b> 27.03.2020                                            |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc. |

## COURSE INFORMATION LETTER

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>University:</b> P. J. Šafárik University in Košice                                                                                                                                                     |                                                |
| <b>Faculty:</b> Faculty of Science                                                                                                                                                                        |                                                |
| <b>Course ID:</b> ÚTVŠ/<br>ZKLS//13                                                                                                                                                                       | <b>Course name:</b> Winter Ski Training Course |
| <b>Course type, scope and the method:</b><br><b>Course type:</b> Practice<br><b>Recommended course-load (hours):</b><br><b>Per week:</b> 36 <b>Per study period:</b> 504<br><b>Course method:</b> present |                                                |
| <b>Number of ECTS credits:</b> 2                                                                                                                                                                          |                                                |
| <b>Recommended semester/trimester of the course:</b>                                                                                                                                                      |                                                |
| <b>Course level:</b> I., II.                                                                                                                                                                              |                                                |
| <b>Prerequisites:</b>                                                                                                                                                                                     |                                                |
| <b>Conditions for course completion:</b>                                                                                                                                                                  |                                                |
| <b>Learning outcomes:</b>                                                                                                                                                                                 |                                                |
| <b>Brief outline of the course:</b>                                                                                                                                                                       |                                                |
| <b>Recommended literature:</b>                                                                                                                                                                            |                                                |
| <b>Course language:</b>                                                                                                                                                                                   |                                                |
| <b>Notes:</b>                                                                                                                                                                                             |                                                |
| <b>Course assessment</b><br>Total number of assessed students: 97                                                                                                                                         |                                                |
| abs                                                                                                                                                                                                       | n                                              |
| 32.99                                                                                                                                                                                                     | 67.01                                          |
| <b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Marek Valanský                                                                                                                                          |                                                |
| <b>Date of last modification:</b> 03.05.2015                                                                                                                                                              |                                                |
| <b>Approved:</b> doc. RNDr. Stanislav Krajčí, PhD., prof. RNDr. Vladimír Zelenák, DrSc.                                                                                                                   |                                                |