# CONTENT

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

| **Course ID:** CJP/ PFAJAKA/07 | **Course name:** Academic English |
|---|---|

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
Combined method of teaching (classroom/distance)
Active classroom participation, assignments handed in on time, 2 absences tolerated
1 test (10th week), no retake. (in classroom, in case of distance learning due to worsened epidemiological situation – online)
Presentation on chosen topic (in case of distance learning - online thorugh MS Teams)
Final evaluation- average assessment of test (40%), essay (30%) and presentation (30%).
Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**
Seal B.: Academic Encounters, CUP, 2002
T. Armer :Cambridge English for Scientists, CUP 2011
M. McCarthy M., O´Dell F. - Academic Vocabulary in Use, CUP 2008
Zemach, D.E, Rumisek, L.A: Academic Writing, Macmillan 2005
Olsen, A. : Active Vocabulary, Pearson, 2013
www.bbclearningenglish.com
Cambridge Academic Content Dictionary, CUP, 2009

**Course language:**
English language, level B2 according to CEFR.

**Notes:**

**Course assessment**
Total number of assessed students: 380

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 33.68 | 22.11 | 15.53 | 10.0 | 6.58 | 12.11 |

**Provides:** Mgr. Viktória Mária Slovenská

**Date of last modification:** 17.09.2020

| **Approved:** |
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**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PPPy/18 | **Course name:** Advanced programming in Python |

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:** ÚINF/PAZ1a/15 and leboÚINF/ePAZ1a/15 and leboÚINF/PRG1/15

**Conditions for course completion:**
At least 50 % of the marks in the continuous assessment
A minimum of 50 % marks in the mid-term and end-of-semester practical tests
or
The final project - 100%

**Learning outcomes:**
Implement solutions to selected problems in Python using available modules. Use and implement non-trivial algorithms to solve selected problems. Use an object-oriented approach to problem solving. Program in Python in an object-oriented manner using Python specifics. Test programs. Implement parallel computing.

**Brief outline of the course:**
1. Introduction to the environment, basic features of Python, simple and structured data types.
2. Input, output, function definition, lambda function, generator notation, function as parameter, string formatting.
3. Control structures, iterating over data structures, context manager.
4. Exception handling and exception raising. Philosophy of exceptions in Python.
5. Working with files. Serialization and deserialization of data - json and pickle protocol. Text and binary files. Manipulation with files. Open data.
6. Object-oriented programming 1. Design of custom classes, special methods, properties, philosophy of accessing methods and attributes.
7. Object-oriented programming 2. Comparison and differences with Java. Multiple inheritance.
8. Method overloading. Static methods, abstract classes, data class.
9. Decorators, memoization, modules, packages.
10. Code validation (debugging), testing (doctest, unittest), test-driven development.
11. Parallel computing, processes, process triggering and inter-process communication (shared variable, pipe, queue).
12. Graphical program design and implementation.

**Recommended literature:**
PILGRIM, Mark. Dive into Python 3. 2. United States of America: Apress, 2004. ISBN 978-1430224150. Dostupné také z: https://diveintopython3.net/

SHIPMAN, John W. Tkinter 8.5 reference: a GUI for Python. Socorro, NM 87801: New Mexico Tech Computer Center, 2013. Dostupné také z: https://anzeljg.github.io/rin2/book2/2405/docs/tkinter/tkinter.pdf
LOTT, Steven F. Mastering Object-oriented Python. Birmingham B3 2PB, UK: Packt Publishing, 2014. ISBN 978-1-78328-097-1.

**Course language:**
Slovak language, knowledge of English language is only required to read documentation of Python.

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 8.57 | 14.29 | 25.71 | 25.71 | 11.43 | 14.29 |

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

**Date of last modification:** 30.08.2021

**Approved:**

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 7

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

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

**Prerequisities:** ÚMV/ALGa/10

**Conditions for course completion:**
Exam

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

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

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

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 290

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 15.52 | 10.69 | 12.76 | 18.62 | 31.72 | 10.69 |

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

**Date of last modification:** 26.03.2020

**Approved:**

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ ASU1/15 | **Course name:** Algorithms and data structures |

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** (ÚINF/PAZ1a/15 and leboÚINF/ePAZ1a/15),(ÚINF/PAZ1b/15 and leboÚINF/ePAZ1b/15)

**Conditions for course completion:**
Practice activities, homeworks and midterm exam.
Final examination consisting of practice and theoretical test.

**Learning outcomes:**
Understand and learn algorithmic paradigms and data structures. Analyse time complexity of these algorithms.

**Brief outline of the course:**
Algorithms' time and space asymptotic complexity. Main Theorem. Amortized complexity.
Brute Force. Backtrack. Divide and Conquer. Dynamic programming. Comparison and non-comparison sort algorithms. Sweep line algorithms. Graph Theory Algorithms.
Data structures – queue, stack, priority queue, heap, prefix sum, binary search trees, interval trees, union & find, trie.

**Recommended literature:**
1, Laaksonen A.: Guide to Competitive Programming: Learning and Improving Algorithms Through Contests (Undergraduate Topics in Computer Science), Springer, 2017, ISBN 978-3319725468
2, Forišek M., Steinová M.: Explaining Algorithms Using Metaphors. Springer Briefs in Computer Science, Springer (2013), ISBN 978-1-4471-5018-3
3, R. Sedgewick, K. Wayne: Algorithms (4th Edition), Addison-Wesley Professional, 2011, ISBN 978-0321573513, http://algs4.cs.princeton.edu/home/
4, Open Data Structures: http://opendatastructures.org/

**Course language:**
Slovak or english

**Notes:**
Content prerequisities:
- programming skills in some programming language (Python/Java/C++/...)
- mathematics:
-- computing with polynomials, logarithmic and exponential functions

-- computing limits of sequences, L’Hospital rule

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 13.01 | 5.48 | 17.12 | 24.66 | 36.99 | 2.74 |

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

**Date of last modification:** 25.02.2021

**Approved:**

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPE/ ALP/06 | **Course name:** Alternative Education |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 4. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**

Total number of assessed students: 242

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 62.81 | 31.4 | 3.31 | 0.83 | 0.41 | 1.24 |

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|---|---|
| **Provides:** Mgr. Katarína Petríková, PhD. | |
| **Date of last modification:** 14.06.2021 | |
| **Approved:** | |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ APS1/15 | **Course name:** Applied probability and statistics |

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

**Number of ECTS credits:** 5

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

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

**Prerequisities:** ÚMV/FRPb/19 and leboÚMV/MTIb/21 and leboÚMV/MZIb/10 and leboÚMV/ MAN2c/10 and leboÚMV/MTFb/15

**Conditions for course completion:**
Written works during the semester, project.
Written and oral exam.

**Learning outcomes:**
Acquired basic concepts, techniques and models of probability theory, statistics and corresponding software.

**Brief outline of the course:**
1) Random event, probability and conditional probability.
2) Probability distribution laws.
3) Characteristics of position, variability and dependence.
4) Basic discrete and continuous distributions.
5) The law of large numbers and the central limit theorem.
6) Random sample. Initial analytical and geometric analysis of data.
7) Quantiles, basic distributions and basic theorem of mathematical statistics.
8) Theory of estimates, method of moments and maximum likelihood. Hypothesis testing.
9) Tests on distribution parameters and goodness-of-fit tests.
10) Modeling of dependencies and noise. Least squares method and smoothing.
11) Polynomial regression models.
12) Pseudorandom quantities and Monte Carlo methods.

**Recommended literature:**
- Cs. Török: Úvod do teórie pravdepodobnosti a matematickej štatistiky, Košice, 1992
- M.R.Spiegel, J.J.Schiller, R.A.Srinivasan, Probability and Statistics, McGraw Hill, 2009
- J. Maindonald, W.J. Braun, Data Analysis and Graphics Using R – an Example-Based Approach, CAMBRIDGE UNIVERSITY PRESS, 2010

**Course language:**
Slovak or english

**Notes:**
Face to face or online teaching.

Content prerequisites:
the basics of differential, integral and matrix calculus

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 17.57 | 17.57 | 21.62 | 12.16 | 29.73 | 1.35 |

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

**Date of last modification:** 02.07.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ AFJ1a/15 | **Course name:** Automata and formal languages |
|---|---|

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Oral examination.

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

**Brief outline of the course:**
1: Chomsky hierarchy of grammars: alphabet, symbol (letter, character), transitive closure, word (string), empty word (empty string), length of a string, concatenation, language, grammar, nonterminal symbol, terminal symbol, initial nonterminal (initial symbol), grammar rule, derivation step, language generated by a grammar, Chomsky hierarchy of grammars - phrase-structure, context sensitive, context free, regular
2: Deterministic finite state automata: finite state automaton, state, input symbol, output symbol, initial state, transition function, output function, examples of automata and their graphic representation, generalized transition and output functions and their basic properties
3: Reduction of automata I: equivalent automata, minimal (optimal) automaton, reachable state, properties of reachable states, elimination of unreachable states
4: Reduction of automata II: equivalent states, k-equivalent states, properties of equivalence and k-equivalence, relation between k-equivalence and (k+1)-equivalence, partitioning the state set into equivalence classes, elimination of equivalent states
5: Reduction of automata III: proof of correctness, unambiguity, and optimality of reduced automaton, testing equivalence of two automata
6: Deterministic finite state acceptors: basic definitions, language recognized by a finite state acceptor, common properties of acceptors and automata with an output, minimizing a finite state acceptor
7: Operations with regular languages: complement, intersection, union, difference, symmetric difference, testing of emptiness, inclusion, equality, and disjointness for regular languages
8: Nondeterministic finite state acceptors: definition, transition function, language recognized by a nondeterministic acceptor, elimination of nondeterminism
9: epsilon-acceptors: definition, properties, elimination of epsilon-transitions

10: Regular grammars: regular grammar, extended regular grammar, transformation of acceptor to a regular grammar, transformation of extended regular grammar to an epsilon-acceptor
11: Regular expressions I: basic properties, transformation of regular expression to an epsilon-acceptor
12: Regular expressions II: regular equations, valid algebraic manipulations with regular expressions, solving an equation with a single unknown variable, solving a system of regular equations, transformation of acceptor to a regular expression
13: Another constructions: review of transformations among various representations, an example of a direct transformation of a grammar to a regular expression, closure of the class of regular languages under another language operations – concatenation and Kleene star, mirror image
14: Another operations: homomorphism and inverse homomorphism, a context-free language that is not regular

**Recommended literature:**

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

**Course language:**

**Notes:**

**Course assessment**

Total number of assessed students: 850

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 25.65 | 18.24 | 23.88 | 17.76 | 9.65 | 4.82 |

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

**Date of last modification:** 17.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 5

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

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

**Prerequisities:** ÚINF/AFJ1a/15

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

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

**Brief outline of the course:**
1: Pushdown automata: definition of a pushdown automaton, accepting by final states, accepting by empty pushdown
2: Deterministic pushdown automata: examples of application in practice
3: Context-free grammars: basic definition, leftmost derivation, derivation tree, elimination of rules of type A→epsilon and A→B, Chomsky normal form
4: Relation between context-free grammars and pushdown automata: transforming context-free grammar to a pushdown automaton, transforming pushdown automaton to a context-free grammar
5: Pumping lemma I: Statement of the lemma and its proof
6: Pumping lemma II: applications of the lemma
7: Closure properties of context-free languages
8: Closure properties of deterministic context-free languages
9: Pushdown automata producing an output: basic definitions and properties, applications in practice
10: Context-sensitive languages: context-sensitive grammar, nondeterministic linear-bounded Turing machine (LBA), transforming context-sensitive grammar to an LBA, transforming LBA to a context-sensitive grammar
11: Closure properties of context-sensitive languages
12: Recursively enumerable languages: phrase-structure grammar, nondeterministic and deterministic Turing machine, transforming nondeterministic Turing machine to a phrase-structure grammar, transforming phrase-structure grammar to a deterministic Turing machine, closure properties
13: Universal Turing machine
14: Algorithmically undecidable problems of the formal language theory

**Recommended literature:**

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 567

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 37.92 | 15.87 | 19.75 | 17.64 | 6.17 | 2.65 |

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

**Date of last modification:** 17.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ BKP/14 | **Course name:** Bachelor Project |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Submission of the bachelor project based on the assignments of the supervisor and acceptance of its content by the supervisor.

**Learning outcomes:**
Bachelor project prepared as a design of a bachelor thesis, as an evidence that student is able to process konwledge available in different resources, citate correctly and keep the layout correctly, prepare a presentation and share the results in front of experts.

**Brief outline of the course:**
The bachelor project is aimed at the selected problem of physics. Based on the assignments student carries out the following activities:
development of the project, formulation of the problem and methods, formal and graphical layout, correct citations and references, basic principles of presentation and its defence.

**Recommended literature:**
1. Resources (literature, papers) based on the project assignments.
2. Regulations No. 1/2011 about final works (thesis for University of P.J. Safarik.

**Course language:**
Slovak, English

**Notes:**

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

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

**Provides:**

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

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

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| **Provides:** |
| **Date of last modification:** |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ BSSM/15 | **Course name:** Bachelor State Exam Physics |
|---|---|

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

**Number of ECTS credits:** 1

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Answering questions concerning selected fields of the subjects of Bachelor state exam.

**Learning outcomes:**
Basic knowledge and overview of konowledge in the fields stated by the Bachelro state exam.

**Brief outline of the course:**
Exam in the field of knowledge in physics consisting of an overview of the following fields:
- Mechanics and molecular physics
- Electricity and magnetism
- Oscillations and waves, optics
- Nuclear physics
- General biophysics
- Theoretical mechanics
- Theory of electromagnetic field
- Statistical physics

**Recommended literature:**

**Course language:**
Slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 39.13 | 34.78 | 17.39 | 0.0 | 8.7 | 0.0 |

**Provides:**

**Date of last modification:** 16.02.2016

**Approved:**

## COURSE INFORMATION LETTER

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ BPO/14 | **Course name:** Bachelor Thesis and its Defence |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of ECTS credits:** 4 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**

Total number of assessed students: 112

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 47.32 | 27.68 | 11.61 | 8.04 | 5.36 | 0.0 |

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| **Provides:** |
| **Date of last modification:** 09.01.2019 |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/BPO/14 | **Course name:** Bachelor Thesis and its Defence |
|---|---|

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Required number of credits gained basedon submitting the bachelor thesis.

**Learning outcomes:**

**Brief outline of the course:**
Presentation of the bachelor thesis results, answering questions of the reviewer and members of professional commission.

**Recommended literature:**

**Course language:**
Slovak or English

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 90.91 | 4.55 | 4.55 | 0.0 | 0.0 | 0.0 |

**Provides:**

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚBEV/ BDD/05 | **Course name:** Biology of Children and Adolescents |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Written test

**Learning outcomes:**
The aim of the subject is to gain the particular level of knowledge about human body and its development. It is neccessary for the understanding of specific biological characteristics of children and adolescents linked to development.

**Brief outline of the course:**
Human ontogenesis. Postnatal development. Age specific features of skeletal and muscalar, 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.

**Recommended literature:**
Drobný I., Drobná M.: Biológia dieťaťa pre špeciálnych pedagógov I. a II. Bratislava, PdF UK, 2000
Lipková V.: Somatický a fyziologický vývoj dieťaťa. Osveta Bratislava, 1980
Malá H., Klementa J.: Biológia detí a dorastu. Bratislava, SPN, 1989

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 1551

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 32.82 | 23.08 | 17.15 | 17.15 | 9.28 | 0.52 |

**Provides:** doc. RNDr. Monika Kassayová, CSc.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KOP/ OPaPDV/14 | **Course name:** Civil Law and Intellectual Property Rights |
| **Course type, scope and the method:**<br>**Course type:** Lecture<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of ECTS credits:** 4 | |
| **Recommended semester/trimester of the course:** 3., 5. | |
| **Course level:** I., II., N | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

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

| abs | n |
|---|---|
| 94.17 | 5.83 |

| |
|---|
| **Provides:** doc. JUDr. Renáta Bačárová, PhD., LL.M., prof. JUDr. Peter Vojčík, CSc. |
| **Date of last modification:** 16.12.2020 |
| **Approved:** |

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

| **Course ID:** CJP/ PFAJKKA/07 | **Course name:** Communicative Competence in English |
|---|---|

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
Active participation in class and completed homework assignments. Students are allowed to miss two classes at the most.
Online teaching (MS Teams), in case of an improved epidemiological situation = on-site teaching.
2 credit tests (presumably in weeks 6/7 and 12/13) and a short oral presentation in English.
The tests will be taken online (MS Teams) during online teaching and in class in case of on-site classes.
The presentation will be sent to the course instructor as a video recording.
Final evaluation consists of the scores obtained for the 2 tests (70%) and the presentation (30%).
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.

**Learning outcomes:**
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, schopnosťprijímať 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.

**Brief outline of the course:**
Rodina, jej formy a problémy
Vyjadrovanie pocitov a dojmov
Dom, bývanie a budúcnosť
Formy a dialekty v anglickom jazyku
Život v meste a na vidieku
Kolokácie a idiomy, zaužívané slovné spojenia
Prázdniny a sviatky vo svete

Životné prostredie a ekológia
Výnimky zo slovosledu
Frázové slovesá a ich použitie
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: 260

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40.38 | 22.31 | 18.85 | 8.85 | 6.54 | 3.08 |

**Provides:** Mgr. Barbara Mitríková, Mgr. Zuzana Naďová

**Date of last modification:** 11.02.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** CJP/ PFAJGA/07 | **Course name:** Communicative Grammar in English |
|---|---|

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
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.

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**
Vince M.: Macmillan Grammar in Context, Macmillan, 2008
McCarthy, O'Dell: English Vocabulary in Use, CUP, 1994
C. Oxengen, C. Latham-Koenig: New English File Advanced, Oxford 2010
Misztal M.: Thematic Vocabulary, Fragment, 1998
www.bbclearningenglish.com
ted.com/talks

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 406

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 39.66 | 18.97 | 16.75 | 8.62 | 5.91 | 10.1 |

**Provides:** Mgr. Lenka Klimčáková

**Date of last modification:** 14.09.2019

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KGER/NJKG/07 | **Course name:** Communicative Grammar in German Language |
|---|---|

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 59.26 | 11.11 | 9.26 | 3.7 | 9.26 | 7.41 |

**Provides:** Mgr. Blanka Jenčíková

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 4

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

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

**Prerequisities:**

**Conditions for course completion:**

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

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

**Recommended literature:**
1. BRIDGES, Douglas. Computability, A Mathematical Sketch book. Springer--Verlag, 1994. ISBN:: 978-0387941745
2. BUKOVSKÝ, Lev. Teória algoritmov, ES UPJŠ, Košice, 1999. ISBN 8070973730
3. MACHTEY, Michael a Paul YOUNG. An Introduction to the General Theory of Algorithms, North--Holland, Amsterdam 1978.
4. KRAJČI, Stanislav. Teória vypočítateľnosti. http://ics.upjs.sk/~krajci/skola/vyucba/ucebneTexty/vypocitatelnost.pdf

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 277

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 46.93 | 11.91 | 13.0 | 5.78 | 6.14 | 16.25 |

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

**Date of last modification:** 08.07.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** ÚFV/NUM/10

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

**Learning outcomes:**
To teach students to use computer as a tool of modeling of physical reality. To present basic deterministic and stochastic approaches to solving mathematical models.

**Brief outline of the course:**
1. Introduction to dynamical systems.
2. Numerical solution of systems of ordinary differential equations with initial condition.
3. Euler's method, convergence, error estimation and order of the method. One-step methods, Tylor-type and Runge-Kuta (RK2, RK4) methods.
4. Multistep methods, general linear method (explicit, implicit). Methods based on numerical quadrature.
5. Boundary value problems for ordinary differential equations.
6. Numerical solution of partial differential equations (PDE). Difference methods, their consistence, convergence and stability. Elliptic PDE.
7. Parabolic PDE, diffusion equation. Explicit and implicit methods.
8. Introduction to the Monte Carlo method. Monte Carlo integration and application in statistical physics.
9. Basics of probability theory. Monte Carlo estimate of mean and standard deviation. Central theorem of Monte Carlo sampling.
10. Simple and importance sampling. Markov chain. Perron-Frobenius theorem. Metropolis algorithm, detailed balance condition.
11. Monte Carlo simulations of lattice spin systems - application to Ising model.
12. Statistical analysis of Monte Carlo data.

**Recommended literature:**
Basic literature:
- C. Pozrikidis: Num. Comp. in Science and Engineering, Oxford Univ. Press, 2008.
- A.L. Garcia: Numerical Methods for Physics, Prentice-Hall, 1994.

- D. P. Landau, K. Binder: A Guide to Monte Carlo Simulations in Statistical Physics, Cambridge Univ. Press, 2021.
Other literature:
- B. A. Berg: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis (http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf)
- W. Janke: Monte Carlo Simulations of Spin Systems (http://www.physik.uni-leipzig.de/~janke/Paper/spinmc.pdf)

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 119

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 31.93 | 17.65 | 12.61 | 16.81 | 13.45 | 2.52 | 0.0 | 5.04 |

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

**Date of last modification:** 30.06.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ UNV1/15 | **Course name:** Computational and cognitive neuroscience I |

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Midterm exam
Final exam consisting of written and/or oral part

**Learning outcomes:**
Overview anatomy, physiology, and cognitive processes in the human brain with focus on computational aspects of cognition and computational tools used in neuroscience.

**Brief outline of the course:**
1. Intro to neural and cognitive science
2. Overview of anatomy and physiology of the central nervous system (CNS)
3. Methods of study in neuroscience. Sensory, motor and associative brain areas.
4. Neuron: anatomy, types, action potential
5. Propagation of signals in the neuron, neural coding.
6. Synaptic transmission and plasticity - neural basis of learning and memory.
7. Psychology of memory and learning.
8. Vision: Intro. Perception of brightness, edges, color. Model BCS/FCS. Perception of size and sitance.
9. Hearing and auditory cognition.
10. Language, psycholinguistics, speech perception and production.
11. Attention.
12. Crossmodal interaction (vision, hearing, touch).
13. Reasoning and decision making.

**Recommended literature:**
1. Poeppel D., Mangun G., Gazzaniga M. (ed.): The Cognitive Neurosciences. 6th ed. MIT Press. 2020. ISBN-13: 978-0262043250
2. Dayan P and LF Abbott: Theoretical Neuroscience - Computational and Mathematical Modeling of Neural Systems. MIT Press, 2005 ISBN-13: 978-0262541855
3. Thagard P: Mind: Introduction to Cognitive Science, 2nd Edition. Bradford Books. ISBN-13⁀: ⁀978-0262701099

**Course language:**

Slovak or English

**Notes:**
Content prerequisites:
Algebra, programming (Matlab).

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 17.24 | 24.14 | 20.69 | 24.14 | 10.34 | 3.45 |

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

**Date of last modification:** 08.07.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PSIN/15 | **Course name:** Computer network Internet |
|---|---|

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:** ÚINF/PAZ1a/15 and leboÚINF/ePAZ1a/15 and leboÚINF/PRG1/15

**Conditions for course completion:**
Activity at excercises (max 18 points), home work (max 18 points), test (max 30 points).
Verbal exam (min 25 points, max 50 points). Required minimum for passing the course is 55 points.

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

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

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

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 791

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 9.73 | 5.18 | 12.64 | 16.43 | 36.16 | 19.85 |

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

**Date of last modification:** 09.07.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ PPFM/15 | **Course name:** Computer-Based Physical Measurement |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
active participation at all labworks
written laboratory records with data analysis

**Learning outcomes:**
Students is able to measure physical quantities and gains skills important for measuring and data processing with the help of computer. The result is deeper conceptual understanding of physical phenomena involved in the labworks that is connected mainly with the content of courses General Physics I,II,III.

**Brief outline of the course:**
The content of the course involves labworks in physics aimed at selected problems of General Physics I,II,III. Student learns about different methods of measurement of physical quantities, he gains skills concerning measurement and data processing with the help of computer. The set of labworks involves analysis of different phenomena followed by the data processing and written report.

**Recommended literature:**
1. Halliday, Hajko, V., Daniel-Szabó, J.: Základy fyziky, Veda Bratislava 1983
2. Veis, Š., Maďar, J., Martišovitš, V.: Všeobecná fyzika 1, Alfa, Bratislava, 1987
3. Hlavička, A. a kol.: Fyzika pre pedagogické fakulty, SPN Praha, 1971
4. Halliday, D., Resnick, R., Walker, J.: Fyzika, part1-4,VUT Brno, 2000

**Course language:**
Slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 64.52 | 9.68 | 25.81 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Zuzana Ješková, PhD.

| |
|---|
| **Date of last modification:** 02.04.2020 |
| **Approved:** |

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ KRS/15 | **Course name:** Cryptographic systems and their applications |

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

**Number of ECTS credits:** 6

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

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

**Prerequisities:**

**Conditions for course completion:**
Homeworks, midterm written exam, active participation in laboratory exercises.
Final written exam, possibly oral exam.

**Learning outcomes:**
This course covers the basic knowledge in understanding and using cryptography. The main focus is on definitions, theoretical foundations, and rigorous proofs of security, with some programming practice. Topics include symmetric and public key encryption, message integrity, hash functions, block cipher design and analysis, number theory, and digital signatures. The course also provides an introduction to cryptographic protocols for authentication and key management, including PKI and certificates.

**Brief outline of the course:**
Classical cryptography, basic information theory, cryptoanalysis, security of classical ciphers. Symmetric ciphers - stream ciphers, block ciphers (DES, AES), modes of operation. Asymmetric ciphers - RSA, Elgamal, elliptic curve cryptosystems. Hash functions, message authentication codes, digital signatures. Authentication, key establishment and distribution, certificates.

**Recommended literature:**
1. PAAR, Ch., PELZL, J.: Understanding Cryptography, Springer 2010.
2. STINSON, D. R.. PATERSON, M. B.: Cryptography: Theory and Practie. CRC Press, 2018.
3. MAO, W. Modern Cryptography: Theory and Practice. Prentice Hall, 2003.
4. MENEZES, A., OORSCHOT, P. van, VANSTONE, S.: Handbook of Applied Cryptography. CRC Press, 1996.
5. SCHNEIER, B.: Applied Cryptography, 20th Edition, John Wiley & Sons Inc., 2015

**Course language:**
Slovak or English

**Notes:**
Content prerequisities: basic number theory and algebra, basic programming

| **Course assessment**<br>Total number of assessed students: 112 | | | | | |
|---|---|---|---|---|---|
| A | B | C | D | E | FX |
| 12.5 | 9.82 | 13.39 | 13.39 | 33.04 | 17.86 |
| **Provides:** RNDr. Rastislav Krivoš-Belluš, PhD. | | | | | |
| **Date of last modification:** 07.07.2021 | | | | | |
| **Approved:** | | | | | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ DBS1a/15 | **Course name:** Database systems |
|---|---|

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

**Number of ECTS credits:** 5

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

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

**Prerequisities:**

**Conditions for course completion:**
Written works during the semester, project.
Written and oral exam.

**Learning outcomes:**
Acquired basic concepts and techniques of relational database theory and corresponding software. Know the principles of relational databases and learn the basics of query language. Understand the formal foundations of database systems - three-valued logic, relational algebra. Be able to model and design DB, and the role of data warehouses.

**Brief outline of the course:**
1) Relational databases. Query language SQL, filtering.
2) Data types, operators, numerical, string and time functions.
3) JOIN operations.
4) AGGREGATION AND GROUP BY.
5) Data and database models. Relational scheme. RDB principles. Data integrity.
6) DB design, ER diagrams.
7) System commands about DB and tables. Cascading deletion and update.
8) Nested queries. ROLLUP. CASE expression.
9) Three-valued logic. Quantifiers and NOT. Set operations.
10) Data science and knowledge acquisition using R.
11) Data warehouses. Data cube. Pivot table.
12) Normalization of relational databases - 1. Relational algebra.

**Recommended literature:**
C.J. Date, Database Design and Relational Theory, 2012, O'Reilly Media, Inc., ISBN: 978-1-449-32801-6
J. Murach, Murach's MySQL, 3rd Edition, 2019, Mike Murach & Associates, Inc., ISBN-10: 1943872368
- R. Ramakrishnan, J. Gehrke, Database Management Systems, 2020, McGraw-Hill, ISBN13 9780071231510
- S. Krajčí: Databázové systémy, UPJŠ, 2005

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 858

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 10.61 | 9.21 | 17.95 | 22.84 | 32.52 | 6.88 |

**Provides:** doc. RNDr. Csaba Török, CSc., Mgr. Dávid Varga

**Date of last modification:** 02.07.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ DBS1b/15 | **Course name:** Database systems |

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

**Number of ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:** ÚINF/DBS1a/15 and leboÚINF/DBdi/15

**Conditions for course completion:**
Written works during the semester, project.
Written and oral exam.

**Learning outcomes:**
Acquired advanced techniques of relational databases. Theoretical foundations of DB normalization, ETNF. Principles of NoSQL databases, MongoDB.

**Brief outline of the course:**
1) Introduction to SQL Server. Set operations. Window functions.
2) Stored procedures. System and user functions.
3) Views. CTE, recursion and transitive closure.
4) Transactions. Cursors. Pivoting.
5) Triggers and integrity. Physical organization of data, B-trees and indexes.
6) XML documents and their querying. JSON.
7) Functional dependencies and NF.
8) The latest normal form - ETNF.
9) Big data and NoSQL.
10) MongoDB, CRUD and cursors.
11) Aggregations and indices.
12) Replication and sharding.

**Recommended literature:**
- Date C.J., Database Design and Relational Theory, O'Reilly, 2012
- I. Ben-Gan, D. Sarka, A. Machanic, K. Farlee, T-SQL Querying, 2015, Microsoft Press, ISBN: 978-0-7356-8504-8
- I. Ben-Gan, T-SQL Fundamentals, Third Edition, 2016, Microsoft Press, ISBN: 978-1-5093-0200-0
- L. Davidson, Pro SQL Server Relational Database Design and Implementation, 2021, Apress, ISBN-13: 978-1-4842-6496-6
- K. Chodorow, MongoDB: The Definitive Guide, O'Reilly, second edition, 2013

**Course language:**

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

**Course assessment**
Total number of assessed students: 732

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 9.7 | 8.2 | 12.3 | 24.45 | 34.97 | 10.38 |

**Provides:** doc. RNDr. Csaba Török, CSc., Mgr. Dávid Varga

**Date of last modification:** 02.07.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPPaPZ/PUDB/15 | **Course name:** Drug Addiction Prevention in University Students |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
1st of the evaluation: active participation in the training part (30p). 2nd part of the evaluation: active participation in workshops (20p). In total, students can get 50p and the final evaluation is as follows: 50 - 45: A; 44 - 40: B; 39-35: C; 34-30: D; 29 - 25: E 24 and less: FX. Detailed information in the electronic bulletin board of the course in AIS2. The teaching of the subject will be realized by a combined method.

**Learning outcomes:**
The student understands the principals of research data based prevention of risk behavior, can describe and explain the determinants of risk behavior as well as protective and risk factors for substance use. Student understands and adequately interprets the theory explaining the background of substance and non-substance addictions.
The student is also able to state and classify the types and forms of prevention, strategies and approaches in prevention, can distinguish effective strategies from ineffective ones.
The student is able to adequately interpret their experience with preventive activities in the group and assume their positive effect as well as limitations and threats.

**Brief outline of the course:**

**Recommended literature:**
Orosová, O. a kol. (2012). Základy prevencie užívania drog a problematického používania internetu v školskej praxi. Košice: UPJŠ.
Sloboda, Z., & Bukoski, J. (Eds.). (2006). Handbook of Drug Abuse Prevention: Theory, Science, and Practice. New York: Springer.
National and international scientific journals.

**Course language:**
slovak

**Notes:**

**Course assessment**
Total number of assessed students: 407

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 69.29 | 22.6 | 5.65 | 2.21 | 0.25 | 0.0 |

**Provides:** prof. PhDr. Oľga Orosová, CSc., Mgr. Marta Dobrowolska Kulanová, PhD., Mgr. Lucia Barbierik, PhD., Mgr. Lenka Abrinková, Mgr. Frederika Lučanská, Mgr. Viera Čurová, Mgr. Marcela Štefaňáková, PhD.

**Date of last modification:** 25.06.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ EDS/15 | **Course name:** Educational software |

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Conditions for ongoing evaluation:
1. Creation of a worksheet for student (with custom graphics).
2. Creation of a multimedia educational presentation (with pictures, animations and sounds).
3. Creation of an interactive educational quiz (with various types of quiz items).
4. Creation of an instructional educational video.
Conditions for the final evaluation:
1. Creation and presentation of final project on the use of educational software in education.
Conditions for successful completion of the course:
Obtaining at least 50% of points for ongoing and final assignments.

**Learning outcomes:**
Students will receive, resp. deepen their basic skills in working with:
a) presentation software, programs for creating and editing images, animations, diagrams, sounds, conceptual maps,
b) programs for the creation of didactic tests, questionnaires, surveys,
c) simulation and modeling software,
d) selected subject-oriented educational programs,
Students present and discuss their idea of the use of educational software and educational Internet resources and tools in the selected school subject.

**Brief outline of the course:**
1. Overview of educational software and educational web resources and tools.
2. Creating and processing images into teaching aids (word clouds, QR codes, diagrams, concept maps).
3. Creating raster animations. Creating and processing sounds.
4. Creation of instructional educational video.
5. Electronic voting (Polleverywhere, Plickers, Kahoot!) and questionnaire creation (Google Forms).
6. Creation of didactic tests (Google Forms, HotPotatoes).
7. Collaborative web applications (mind42, miro, whiteboard, padlet).
8. Online communication tools (BBB).

9. Complex online learning environments (Moodle).
10. Online educational projects and competitions (eTweening, WebQuest, PALMA junior).
11. Simulations and modelling (WolframAlpha, PhET, Geogebra). Subject-focused educational programmes.
12. Creation of educational software in Scratch environment.

**Recommended literature:**

SOLOMON, Gwen and Lynne SCHRUM, 2014. Web 2.0 How-to for Educators. Second. International Society for Technology in Education, 314 p. ISBN 978-1564843517.
STOBAUGH, Rebecca, 2019. Fifty Strategies to Boost Cognitive Engagement: Creating a Thinking Culture in the Classroom (50 Teaching Strategies to Support Cognitive Development). Solution Tree Press, 176 p. ISBN 978-1947604773.
LEMOV, Doug, 2015. Teach Like a Champion 2. 0: 62 Techniques That Put Students on the Path to College [online]. 2nd edition. John Wiley & Sons, Incorporated, 509 p. [cited 2021-7-10]. ISBN 9781118898628. Available from: https://ebookcentral.proquest.com/lib/upjs-ebooks/detail.action?docID=1895720
European Schoolnet: Transforming education in Europe [online]. [cited 2021-7-10]. Available from: http://www.eun.org/home
Science On Stage Europe [online]. Science on Stage Europe e.V. [cited 2021-7-10]. Available from: https://www.science-on-stage.eu/

**Course language:**
Slovak and partly English due to selected programs and information sources

**Notes:**
By default, teaching is carried out face to face. If this is not possible (eg due to a pandemic), teaching is provided at a distance through video conferencing programs and LMS.

**Course assessment**
Total number of assessed students: 52

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 61.54 | 19.23 | 13.46 | 0.0 | 5.77 | 0.0 |

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

**Date of last modification:** 01.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ELP1/01 | **Course name:** Electonics Practical |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:** ÚFV/ELE1/07 and leboÚFV/ELEM1/15

**Conditions for course completion:**
Debate with students during practice, trial preparation and processing of theoretical and experimental results of their defense.
Summary evaluation of student activities while working on set topics of study practices.

**Learning outcomes:**
Practical work of students in the design, construction and properties of the measurements of electronic circuits and interpretation of the results obtained to verify and consolidate the theoretical knowledge acquired in lectures on the subject Electronics.

**Brief outline of the course:**
1. Combinatorial logical circuits. 2.Logical memory circuits. 3. Logical sequence circuits. 4. Rectifiers, filters, stabilizers. 5. Amplifier with bipolar transistor. 6. Stabilized DC power supplies. 7. Generators of harmonic signals. 8. Operational amplifiers and operational network interfaces. 9. Digital-to-analog converters. 10. Analog-to-digital converters. 11 Reserve.

**Recommended literature:**
1. Delaney C.F.G.: Electronics for the Physicist with Aplications. John Willey & Sons, New York, 1980.
2. Zbar P.B., Malvino A.P., Miller M.A.: Basic Electronics: a Text-Lab Manual. Macmillan/ McGraw – Hill, New York, 1994.

**Course language:**
slovak or english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 92.86 | 0.0 | 2.38 | 4.76 | 0.0 | 0.0 |

**Provides:** RNDr. Vladimír Tkáč, PhD.

**Date of last modification:** 29.03.2020

| **Approved:** |
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## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ELEM1/15 | **Course name:** Electronics |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:** ÚFV/VF1b/03 and leboÚFV/VFM1b/15

**Conditions for course completion:**
Exam

**Learning outcomes:**
To explain physical principles of classical electronic components and systems and technologies of their realization. To perform analysis of properties and functions of basic electronic elements, electronic circuits and information transmission and processing systems. To introduce student into basic elements and devices in area of nanoelectonics and to explain methods of their fabrication and principles of their functioning.

**Brief outline of the course:**
Structure, properties and physical principles of the activity of selected electronic elements. Analysis of functions and properties of basic analog and digital electronic circuits. Nanoelectronics and selected building components of nanoelectronics: graphene, carbon nanotubes, selected types of nanodevices their properties, fabrication and integration to functional systems.

**Recommended literature:**
1. Brown P.B., Frantz G.N., Moraff H.: Electronics for the Modern Scientist. Elsevier, 1982.
2. Delaney C.F.G.: Electronics for the Physicist with Aplications. John Willey & Sons, 1980.
3. Wolt E. L.: Quantum Nanoelectronics, An introduction to electronic nanotechnology and quantum computing, Wiley-VCh, 2009

**Course language:**
Slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.78 | 24.39 | 28.66 | 10.98 | 5.49 | 6.71 |

**Provides:** prof. RNDr. Peter Kollár, DrSc., RNDr. Vladimír Tkáč, PhD.

**Date of last modification:** 05.10.2015

| **Approved:** |
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## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** CJP/ PFAJ4/07 | **Course name:** English Language of Natural Science |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Distant form of study (Online through MS teams) - based on the sylabus
Active participation in class and completed homework assignments. Students are allowed to miss 2 classes at the most (in case of online form - not attending online class/ assignments not handed in)
Continuous assessment: 2 credit tests taken thorugh MS Teams online(presumably in weeks 6 and 13) and academic presentation in English given through MS Teams online.
In order to be admitted to the final exam, a student has to score at least 65 % as a sum of both credit tests.
The exam test results represent 50% of the final grade for the course, continuous assessment results represent the other 50% of the final grade.
The final grade for the course will be calculated as follows:
A 93-100, B 86-92, C 79-85, D 72-78, E 65-71, FX 64 and less.

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

**Brief outline of the course:**
1. Introduction to studying language
2. Selected aspects of scientific language
3. Talking about academic study
4. Discussing science
5. Defining scientific terminology and concepts
6. Expressing cause and effect
7. Describing structures
8. Explaining processes
9. Comparing objects, structures and concepts
10. Talking about problem and solution
11. Referencing authors

12. Giving examples
13. Visual aids and numbers
14. Referencing time and place
Presentation topics related to students´study fields.

**Recommended literature:**

study materials provided by the course instructor
Redman, S.: English Vocabulary in Use, Pre-intermetdiate, Intermediate. Cambridge University Press, 2003.
Armer, T.: Cambridge English for Scientists. CUP, 2011.
Wharton J.: Academic Encounters. The Natural World. CUP, 2009.
Murphy, R.: English Grammar in Use. Cambridge University Press, 1994.
P. Fitzgerald : English for ICT studies. Garnet Publishing, 2011.
https://worldservice/learningenglish, https://spectator.sme.sk
www.isllibrary.com

**Course language:**

**Notes:**

**Course assessment**

Total number of assessed students: 2744

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 38.16 | 25.4 | 16.65 | 9.73 | 7.87 | 2.19 |

**Provides:** Mgr. Lenka Klimčáková, Mgr. Viktória Mária Slovenská, Mgr. Zuzana Naďová

**Date of last modification:** 14.02.2021

**Approved:**

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ BSSMI/15 | **Course name:** Essentials of Informatics |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of ECTS credits:** 1 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I. | |
| **Prerequisities:** ÚINF/PSIN/15,ÚINF/PAZ1b/15,ÚINF/OSY1/15,ÚINF/AFJ1a/15,ÚINF/ SLO1a/15 | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 12.5 | 25.0 | 12.5 | 0.0 | 50.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 16.06.2017 |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ VBFM1/15 | **Course name:** General Biophysics I |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Exam.

**Learning outcomes:**
To provide information about the object, significance and role of biophysics in science. The main emphasis will be given on the understanding of the principles determining the structure and function of the most important biological structures (nucleis acids, proteins, biomembranes) as well as on the thermodynamics and kinetics of selected chemical and biophysical processes.

**Brief outline of the course:**
The definition of biophysics and its role in the science. Intra- and inter-molecular interactions in biological systems. Function and structure of the important biomacromolecules (nucleic acids, proteins, biomembranes, sugars). Conformational transitions in biopolymers: helix-coil transition in DNA, denaturation of proteins, phase transitions in biomembranes.
Thermodynamics of biological processes. Gibbs energy and chemical equilibrium, chemical potential, binding constants of the ligand-macromolecule intractions, cooperativity of the binding between biological important molecules, membrane potential.
Kinetics of the chemical and biophysical processes. The principles of chemical kinetics, enzymatic reactions, inhibition of the enzymes, membrane transport, introduction to the pharmacokinetics.
Cell biophysics. The basic bioenergetic processes, oxidative phosphorylation, photosynthesis. Mechanisms of regulations and control processes in cells-the basic principles.
Medicinal biophysics. Biophysical principles of selected diagnostic and therapeutical methods.
Radiation and environmental biophysics. The influence of physico-chemical factors of the environment on the living systems.

**Recommended literature:**
1. M. B. Jackson, Molecular and cellular biophysics, Cambridge University Press, 2006.
2. M. Daune, Molecular biophysics - Structures in motion, Oxford University Press, 2004.
3. R. Glaser, Biophysics, Springer Verlag, 2001.
4. M.V. Volkenštein, Biofizika, Nauka, Moskva 1988.
5. W.Hoppe and W. Lohmann, Biophysics, Springer Verlag, 1988.
6. D.G. Nichols and S.J. Ferguson, Bioenergetics 3, Academic Press, Elsevier Science Ltd., 2002.
7. D. T. Haynie, Biological thermodynamics, Cambridge University Press, 2001.

**Course language:**
Slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14.29 | 42.86 | 42.86 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. Mgr. Daniel Jancura, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ VFM1a/15 | **Course name:** General Physics I |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 4 / 2 **Per study period:** 56 / 28<br>**Course method:** present | |
| **Number of ECTS credits:** 6 | |
| **Recommended semester/trimester of the course:** 1. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Monitoring tests during the calculus lessons<br>1. in the 6th week<br>2.in the 12th week<br>Final assessment is based on th results of :<br>- oral examination<br>assessment of the calculus lessons (written tests, overall performance during the lessons) | |
| **Learning outcomes:**<br>Basic knowledge about the mechanics, molecular physics and thermodynamics. | |
| **Brief outline of the course:**<br>Basic knowledge of the calculus, vector algebra. Standards and units. Kinematics. Dynamics. The principle of relativity in the classical mechanics. Gravitation. Mechanics of many-particle systems. The motio of rigid bodies. Deformation, elasticity. Mechanics of fluids and gases. Laws of ideal gases. Kinetic theory. The thermodynamic laws. Statistical character of the second law. Entropy. Molecular phenomena in liquids and solids. Phase transitions. | |
| **Recommended literature:**<br>Hajko V., Daniel-Szabó J.: Základy fyziky, VEDA, Bratislava 1983.<br>Veis Š., Maďar J., Martišovits V.: Všeobecná fyzika I., Mechanika a molekulová fyzika, ALFA Bratislava, 1987.<br>Fuka J., Široká M.: Obecná fyzika I / skriptum /, PF Univ. Palackého, Olomouc 1983.<br>Hlavička A., a kol.: Fyzika pre pedagogické fakulty, SPN, Praha 1971.<br>Hajko V., a kol.:Fyzika v príkladoch, ALFA Bratislava 1983.<br>Ilkovič D.: Fyzika, SVTL Bratislava, 1962.<br>Slaviček V., Wagner J.: Fyzika pro chemiky, SNTL Praha 1971.<br>Krempaský J.: Fyzika, ALFA Bratislava 1982. | |
| **Course language:**<br>Slovak | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 206

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 27.67 | 16.5 | 19.42 | 13.59 | 19.42 | 3.4 |

**Provides:** doc. RNDr. Zuzana Ješková, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/VFM1b/15 | **Course name:** General Physics II |
|---|---|

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

**Number of ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:** ÚFV/VF1a/12 and leboÚFV/VFM1a/15

**Conditions for course completion:**
Two written distance tests.
Distance oral exam.

**Learning outcomes:**
To obtain a general view on basic electric magnetic phenomena and ability to solve basic problems of this subject.

**Brief outline of the course:**
Electric field in the free space. Work of the forces in the electrostatic field. Electrostatic field and steady current. Current in electrolytes, semiconductors, gasses and vacuum. Thermoelctric effects. Magnetic field in the free space. The interaction of moving charges with the electric current. Quasi steady electric field. Electromagnetic induction. Energy of magnetic field. AC current and circuits with ac current. Multiphase AC current. Rotating magnetic field. Electric effects in the substances. Magnetic properties of the substancies. Magnetic polarization. Diamagnetism and paramagnetism, Magnetic ordering. Ferromagnetism.

**Recommended literature:**
I. S. Grant, W.R. Phillips, Electromagnetism, John Wiley&Sons, Ltd, England, 1990

**Course language:**
english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 41.03 | 15.38 | 20.51 | 5.13 | 2.56 | 15.38 |

**Provides:** prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Erik Čižmár, PhD.

**Date of last modification:** 29.03.2020

| **Approved:** |
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## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ VFM1c/15 | **Course name:** General Physics III |
|---|---|

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

**Number of ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:** ÚFV/VF1b/03 and leboÚFV/VFM1b/15

**Conditions for course completion:**
Exam+ 2 succesfull test from seminars

**Learning outcomes:**
The objective is to acquaint the students with the basis of oscilations, waves and optics.

**Brief outline of the course:**
Undamped oscilations, Mathematical, Physical and Torsional pendulum, Damped oscilations, Fourier transformation, Forced oscilations. Waves, their generation, waves equation.Interference. Huyghens principle. Reflection, difraction. Doppler effect. Waves speed in materials. Acoustics. Geometrical optics. Mirrors, lens. Fotometry.
Light as electromagnetic wave. Dispersion, absorption, interference, difraction, polarization. Photon's theory of light. Law of emision and absorption, Planck's law of radiation. Lasers.

**Recommended literature:**
1. A. Hlavička et al., Fyzika pro pedagogické fakulty, SPN, 1971
2. R.P. Feynman et al., Feynmanove prednášky z Fyziky I,II,III, ALFA, 1985
3. D. Halliday et al.,Fyzika-Vysokoškolská učebnice obecné fyziky, VUTIUM, 2010
4. J. Fuka, B. Havelka, Optika a atómová fyzika, SPN,1961
5. A. Štrba, Všeobecná Fyzika 3 – Optika, ALFA, 1979

**Course language:**
slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 38.81 | 19.4 | 25.37 | 10.45 | 5.97 | 0.0 |

**Provides:** doc. RNDr. Ján Füzer, PhD.

**Date of last modification:** 03.05.2015

| **Approved:** |
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## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ VFM1d/15 | **Course name:** General Physics IV |
|---|---|

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

**Number of ECTS credits:** 6

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

**Course level:** I.

**Prerequisities:** ÚFV/VF1c/10 and leboÚFV/VF1c/12 and leboÚFV/VFM1c/15

**Conditions for course completion:**
full-time form: 2x control exam, examination,
distance form in 2020/21:
continuous assignments, 2 x control test, exam

**Learning outcomes:**
Basic knowledge about the atomic structure and spectra and nuclei, and elementary particles. Basic experimental methods in nuclear physics and passage of nuclear radiation through media.

**Brief outline of the course:**
Wave character of particles. De Broglie waves. Experimental evidence for de Broglie waves. Structure and models of atoms. Atomic spectra. Magnetic properties of atoms. X-ray spectra. Basic characteristics of the atomic nuclei. Nuclear forces and models. Radioactivity. Applications of radioactivity. Nuclear reactions. Elementary particles, basic properties and classification. Types of interactions. Resonances. Cosmic rays. Passage of particles through matter. Detectors. Accelerators.

**Recommended literature:**
1. Beiser A., Úvod do moderní fyziky, Praha, 1975.
2. Úlehla I., Suk M., Trka Z.: Atómy, jádra, částice, Praha, 1990.
3. Síleš E., Martinská G.: Všeobecná fyzika IV, skriptá PF UPJŠ, 2. vydanie, Košice, 1992.
4. Vrláková J., Kravčáková A., Vokál S.: Zbierka príkladov z atómovej a jadrovej fyziky, skriptá PF UPJŠ, Košice, 2016.
5. Hajko V. and team of authors, Physics in experiments, Bratislava, 1997.
6. Nosek D., Jádra a částice (Řešené příklady), Matfyzpress, MFF UK, Praha 2005,
7. Kravčáková A., Vokál S., Vrláková J., Všeobecná fyzika IV, 1.časť Atómová fyzika, skriptá PF UPJŠ, Košice, 2020.
8. Yang F., Hamilton J.H., Modern Atomic and Nuclear Physics, WSC Singapore, 2010.

**Course language:**
slovak and english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 73.08 | 7.69 | 15.38 | 0.0 | 3.85 | 0.0 |

**Provides:** prof. RNDr. Stanislav Vokál, DrSc., doc. RNDr. Janka Vrláková, PhD., doc. RNDr. Adela Kravčáková, PhD.

**Date of last modification:** 05.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 4

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

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 742

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 60.78 | 13.88 | 12.67 | 8.63 | 3.37 | 0.67 |

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

**Date of last modification:** 25.03.2020

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPE/ INP/17 | **Course name:** Inclusive Pedagogy |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 83.33 | 16.67 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** PaedDr. Janka Ferencová, PhD.

**Date of last modification:** 08.06.2021

**Approved:**

**COURSE INFORMATION LETTER**

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ IKTP/15 | **Course name:** Information and Communication Technologies |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
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".

**Learning outcomes:**
To achieve and extend fundamental information and communication knowledge to the level which is acceptable in the EU region.

**Brief outline of the course:**
Text processing using a word processor.
Processing and evaluation of information using a spreadsheet.
Search, retrieval and exchange of information via the Internet.
Creating presentations.

**Recommended literature:**
1. Franců, M: Jak zvládnout testy ECDL. Praha : Computer Press, 2007. 160 s. ISBN 978-80-251-1485-8.
2. Jančařík, A. et al.: S počítačem do Evropy – ECDL. 2. vydanie. Praha : Computer Press, 2007. 152 s. ISBN 80-251-1844-3.
3. Kolektív autorov: Sylabus ECDL verzia 5.0. [on-line] [citované 9.2.2010]. Dostupné na internete: <http://www.ecdl.sk/buxus/docs//interne_informacie/Sylabus_V5.0/20090630ECDL-SylabusV50_SK-V01_FIN.pdf>.

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 1022

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 65.46 | 17.71 | 6.95 | 3.62 | 1.66 | 4.6 |

**Provides:** Mgr. Alexander Szabari, PhD., doc. RNDr. Ľubomír Šnajder, PhD.

| |
|---|
| **Date of last modification:** 03.05.2015 |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

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

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ UAS/13 | **Course name:** Introduction to Astronomy |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Test.

**Learning outcomes:**
Acquaint students with basic astronomy and astrophysic contnceps, celestial coordinates, Solar system, formation and evolution of stars and galaxies

**Brief outline of the course:**
Subject of astronomy, celestial coordinates and their transformations, time and calendar, problem of 2 bodies, Astronomical telescopes, Solar system, radiation of stars and spectrum, properties of stars and their evolution, galaxies.

**Recommended literature:**
1. Čeman, R., Pittich, E., 2002, Vesmír 1 - Slnečná sústava, MAPA Slovakia
2. Čeman, R., Pittich, E., 2003, Vesmír 2 - Hviezdy - Galaxie, MAPA Slovakia
3. Grygar, J., Horský, Z., Mayer, P., 1979, Vesmír, Mladá fronta
4. Kleczek, J., 2002, Velká encyklopedie vesmíru, Academia
5. Pittich, E., Kalmančok, D., 1981, Obloha na dlani, Obzor
6. Vanýsek, V.: 1980, Základy astronomie a astrofyziky, Academia

**Course language:**

**Notes:**

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

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

**Provides:** doc. Mgr. Štefan Parimucha, PhD.

**Date of last modification:** 02.04.2020

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ UVF/05 | **Course name:** Introduction to General Physics |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Active presentation during the lessons twice a year
Solved assignments
Positive results at two written tests

**Learning outcomes:**
Conceptual understanding of the key concepts of the topics of Mechanics and Molecular Physics gained with the help of problem solving, physical experiments and multimedial support that is inevitable precondition for the further study at University level. At the end of this course the student will be able to follow with the courses proceeding from the course General Physics I.

**Brief outline of the course:**
The subject is a supportive subject to the course General physics 1 - Mechanics and Molecular Physics. The content involves key concepts in mechanics and molecular physics with the help of school experiments, interactive multimedial teaching materials and physical tasks and problems. The aim is to help students to overcome difficulties connected with knowlege gained during the previous study towards the conceptual understaning of the University course content.

**Recommended literature:**
1. Sutton, R.M., Demonstration Experiments in Physics, AAPT, 2003
2. Pizzo, J.: Interactive Physics demonstration, AAPT, 2001
3. Cunningham, J, Herr, N.: Hands on Physics Activities, Jossey-Bass A Wiley Imprint, 1994
4. Halliday D., Resnick R., Walker J.: Fyzika. Část 1- 5., Vysokoškolská učebnica fyziky, VUTIUM, Brno, 2000
5. Walker, J.: The Flying Circus of Physics with answers, John Wiley&Sons, 2005
6. Hajko, V., Daniel-Szabó, J. a kol. Fyzika v príkladoch, Alfa, 1983

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 286

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 37.76 | 18.88 | 23.43 | 13.99 | 5.59 | 0.35 |

**Provides:** doc. RNDr. Zuzana Ješková, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ UVF2/07 | **Course name:** Introduction to General Physics II |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Active presentations duringf the lessons twice a year
Solved assignments
Postive results at two written tests.

**Learning outcomes:**
Conceptual understanding of the key concepts of the topics of Electricity and Magnetism with the help of problem solving, physical experiments and multimedial support that is inevitable precondition for the further study at University level. At the end of the course the studnet will be able to follow with the courses, proceeding from the course General physics II.

**Brief outline of the course:**
The subject is a supportive subject to the course General Physics 2 - Electricity and Magnetism. The content involves key concepts of electricity and magntism with the help of school experiments, interactive multimedial teaching materials and physical tasks and problems. The aim is to help students to overcome difficulties connected with knowledge gained during the previous study towards the conceptual understanding of the University course content.

**Recommended literature:**
1. Sutton, R.M., Demonstration Experiments in Physics, AAPT, 2003
2. Pizzo, J.: Interactive Physics demonstration, AAPT, 2001
3. Cunningham, J, Herr, N.: Hands on Physics Activities, Jossey-Bass A Wiley Imprint, 1994
4. Halliday D., Resnick R., Walker J.: Fyzika. Část 1- 5., Vysokoškolská učebnica fyziky, VUTIUM, Brno, 2000
5. Walker, J.: The Flying Circus of Physics with answers, John Wiley&Sons, 2005

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 234

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 41.45 | 20.09 | 21.79 | 7.69 | 8.97 | 0.0 |

**Provides:** doc. RNDr. Zuzana Ješková, PhD.

**Date of last modification:** 02.04.2020

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ZMF/17 | **Course name:** Introduction to Mathematics for Physicists |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 264

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40.53 | 21.97 | 17.42 | 10.98 | 9.09 | 0.0 |

**Provides:** RNDr. Tomáš Lučivjanský, PhD., doc. RNDr. Jozef Hanč, PhD.

**Date of last modification:** 14.09.2017

**Approved:**

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** Dek. PF UPJŠ/USPV/13 | **Course name:** Introduction to Study of Sciences |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 12s / 3d<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 1. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |
| **Course assessment**<br>Total number of assessed students: 1734 | |

| abs | n |
|---|---|
| 86.51 | 13.49 |

| | |
|---|---|
| **Provides:** doc. RNDr. Marián Kireš, PhD. | |
| **Date of last modification:** 25.09.2019 | |
| **Approved:** | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 5

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

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

**Prerequisities:**

**Conditions for course completion:**

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

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

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 297

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 13.8 | 10.44 | 13.8 | 23.57 | 29.97 | 8.42 |

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ UIB1/17 | **Course name:** Introduction to information security |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I., N

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 37.5 | 37.5 | 14.29 | 7.14 | 1.79 | 1.79 |

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

**Date of last modification:** 27.03.2019

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 5

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

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

**Prerequisities:**

**Conditions for course completion:**
The condition for passing the course is the realization of a project with the application of neural networks, successful completion of two written tests in the field of neural networks and genetic algorithms, as well as successful completion of the written and oral part of the exam.

**Learning outcomes:**
The result of the education is an understanding of the basic principles of neural networks and genetic algorithms. The student will gain the ability to apply the acquired knowledge in intelligent data analysis and also work with a selected tool for modeling neural networks.

**Brief outline of the course:**
1. Basic concept arising from biology. Linear threshold units, polynomial threshold units, functions calculable by threshold units.
2. Perceptrons. Linear separable objects, adaptation process (learning), convergence of perceptron learning rule, higher order perceptrons.
3. Forward neural networks, hidden neurons, adaptation process (learning), backpropagation method.
4. Recurrent neural networks. Hopfield neural networks, properties, associative memory model, energy function, learning, optimization problems (business traveler problem).
5. Model of gradually created network. ART network, architecture, operations, initialization phase, recognition phase, search and adaptation phase. Use of the ART network.
6. Applications of studied models in solving practical problems.
7. Written test I.
8. Motivation to model genetic elements. Genetic algorithm. Application of genetic algorithms.
9. Genetic programming, root trees, Read's linear code. Basic stochastic optimization algorithms: blind algorithm and climbing algorithm. Forbidden search method.
10. Genetic and evolutionary programming with typing, examples of use. Grammatical evolution.
11. Special techniques of evolutionary computations. Selection mechanisms in evolutionary algorithms.
12. Use of genetic algorithms in training neural networks. Artificial life.
13. Written test II.

**Recommended literature:**

1. AGGARWAL, Charu C. Neural networks and deep learning: a textbook. Cham: Springer, 2018. ISBN 978-3319944623.
2. KVASNIČKA, Vladimír. Úvod do teórie neurónových sietí. [Slovenská republika]: IRIS, 1997. ISBN 80-88778-30-1.
3. KVASNIČKA, Vladimír. Evolučné algoritmy. Bratislava: Vydavateľstvo STU, 2000. Edícia vysokoškolských učebníc. ISBN 80-227-1377-5.
4. MITCHEL, Melanie. An Introduction to Genetic Algorithms. Cambridge: MIT Press, 2002. ISBN 0-262-63185-7.
5. SINČÁK, Peter, ANDREJKOVÁ, G. Úvod do neurónových sietí, I. diel, Košice: ELFA, 1996. ISBN 808878638X

**Course language:**
Slovak or English

**Notes:**
Content prerequisites:
Basics of programming in Python, or another alternative programming language suitable for data analysis

**Course assessment**
Total number of assessed students: 439

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14.12 | 17.08 | 22.55 | 19.13 | 22.78 | 4.33 |

**Provides:** RNDr. Ľubomír Antoni, PhD., RNDr. Šimon Horvát

**Date of last modification:** 26.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 284

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 43.31 | 17.25 | 13.38 | 8.45 | 3.17 | 14.44 |

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/MTFa/15 | **Course name:** Mathematics I for physicists |
|---|---|

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Two written tests and one homework with excercises from the whole semester. The final evaluation is given according to the results from the semester and in view of the results of the written final test.

**Learning outcomes:**
To obtain basic knowledge on functions of one variable and their properties; to be able to apply the theory in concrete excercises.

**Brief outline of the course:**
Functions, basic properties. Elementary functions. Continuous functions. Limits. Derivation and its geometric aplications. Theorems about continuous functions. Behaviour of functions. Indefinite integrals, basic methods of integration. Definite integral and its applications.

**Recommended literature:**
S. Lang: A First Course in Calculus, Springer Verlag, 1998

**Course language:**
Slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30.0 | 25.0 | 30.0 | 10.0 | 5.0 | 0.0 |

**Provides:** Mgr. Katarína Lučivjanská, PhD., Mgr. Barbora Klemová, Mgr. Diana Plačková

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚMV/MTFb/15 | **Course name:** Mathematics II for physicists |
|---|---|

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** ÚMV/MTFa/15

**Conditions for course completion:**
Two written tests and one homework with excercises from the whole semester, final test.
According to the results from the semester and in view of the results of the written final test.

**Learning outcomes:**
To develop acquired knowledge of mathematical analysis with knowledge on linear algebra and functions of more variables. To learn to solve basic types of differential equations and know how to use them to model real-world phenomena. To learn to solve problems about infinite series.

**Brief outline of the course:**
System of linear algebraic equations, determinants. Functions of more variables, continuity and limits, partial derivations, local extremes of functions of two variables. Some types of differential equations. Series, functional series, Taylor and MacLaurin series.

**Recommended literature:**
1. S. Lang: A First Course in Calculus, Springer Verlag, 1998
2. Huťka V., Benko E., Ďurikovič V.: Matematika, Alfa, Bratislava 1991.
3. Došlá, Z.: Matematika pro chemiky, 1.díl. Masarykova univerzita, Brno, 2010.

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 16

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 43.75 | 25.0 | 25.0 | 6.25 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Stanislav Lukáč, PhD., Mgr. Stanislav Basarik, Mgr. Zuzana Šárošiová

**Date of last modification:** 03.05.2015

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ SDFM1/15 | **Course name:** Methods of Data Processing in Physics |

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Exam test - 60%, tasks in Matlab/Octave - 40%.

**Learning outcomes:**
Methods of data processing in physics.

**Brief outline of the course:**
1. Numerical processes and their errors. Particular properties of computer representation of numerical data. Introduction in Matlab/Octave.
2. Approximation and interpolation of a function. Algebraic multinomials. Newton, Lagrange, Hermit and spline interpolation. Selection of interpolation knots.
3. Numerical methods for calculation of definite integral – rectangular, trapezoidal, Simpson.
4. Numerical differentiation.
5. Numerical solution of ordinary differential equations – Euler's method and modifications, Runge-Kutta method.
6. Approximate solution of non-linear equations. Roots separation, simple iteration and its convergency. Tangent, secant and combined methods.
7. Iterative solution of linear system of algebraic equations, Gauss method.
8. Linear regression. Regression models, least-square criterion.
10. Non-linear regression models.
8. Basics of probability theory and mathematical statistics - systematic and random errors, Gaussian distribution, three-sigma rule, central limit theorem.
11. Computer simulation of real processes - Monte-Carlo method (principles, random quantities, pseudo-random number generators).
12. Simulation of particle transport through solid.

**Recommended literature:**
1. Buchanan J. L., Turner P. R.: Numerical Methods and Analysis. McGraw-Hill, Inc., New York, 1992.
2. Hrach R.: Počítačová fyzika I,II. Skriptum PF UJEP. Ed. stredisko UJEP, Ústí nad Labem, 2003.
3. Petrovič P., Nadrchal J., Petrovičová J.: Programovanie a spracovanie dát I, II. Edičné stredisko UPJŠ, Košice 1989.

4. Petrovič P.: Fyzika I – Vybrané kapitoly z klasickej fyziky a počítačovej fyziky. Vydavateľstvo equilibria, Košice, 2009.
4. Siegel A. F.: Statistics and Data Analysis. An Introduction. J. Wiley&Sons, NY, 1988.

**Course language:**
slovak, basics of english

**Notes:**

**Course assessment**
Total number of assessed students: 4

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

**Provides:** doc. RNDr. Erik Čižmár, PhD.

**Date of last modification:** 18.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ MFYU/15 | **Course name:** Methods of Physical Problems Solving |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 5. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Successfull in two writing exams oriented on problem solving. | |
| **Learning outcomes:**<br>Student is able to use the selected method of problem solving. He(she) is experienced in solving problems from physics olympiad with comments. Student knows how to use multimedia support and modelling for problem solving. | |
| **Brief outline of the course:**<br>1. Clasification of selected physics problem solving methods<br>2. Mechanics<br>3. Multimedia support for problem solving<br>4. Hydromechanics<br>5. Physics problems series<br>6. Termodynamics<br>7. Physics olympiad<br>8. Physics olympiad problem solving with comments<br>9. Electric current<br>10. Qualitative physics problems<br>11. Mechanical oscillations<br>12. Dynamics modeling and problem solving | |
| **Recommended literature:**<br>Halliday, D., Resnick, R., Walker, J.: Fyzika 1-5, Akademické nakladatelství, VUTIUM, ISBN: 8021418680, 2007 | |
| **Course language:**<br>Slovak, English | |
| **Notes:** | |

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 81.82 | 9.09 | 9.09 | 0.0 | 0.0 | 0.0 |

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ RIM1/15 | **Course name:** Metódy riešenia informatických úloh |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 57

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22.81 | 33.33 | 24.56 | 3.51 | 7.02 | 8.77 |

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ MTFM/20 | **Course name:** Modern Trends in Physics |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Test

**Learning outcomes:**
Presentation of scientific goals and experimental facilities on the Institute of Physics. Discussion of new trends in physics of micro-world, astrophysics, biophysics and physics of condensed matter.

**Brief outline of the course:**
The present state of the micro-world physics – fundamental particles and the interaction forces. Theoretical description of the micro-world – the Standard Model. Experimental tests of the Standard Model - the discovery of neutral currents and intermediate W+-, Z0 bosons. Heavy ion collisions and the search for new state of matter - quark gluon plasma - on the most powerful accelerators RHIC (Relativistic Heavy Ion Collider), Brookhaven National Laboratory) , USA and on the constructed LHC (Large Hadron Collider), CERN, Geneva. Big Bang and the quark gluon plasma. Some open questions – search for Higgs boson, responsible for the mass of fundamental particles and quark gluon plasma in laboratory conditions.
Practical activities – demonstration of the knowledge from lectures at identification of the real Z0 decay events in experimental data from the LEP accelerator, CERN, Swizterland.
New trends in astrophysical investigation: Solar system planets and exoplanets; cataclysmic variables, blazers and polars; black holes; quasars and active galactic nuclei, clusters of galaxies and web structure of Universe; gravitational lensing, dark matter and dark energy; gamma ray bursts.
Topical problems in biophysics
Low temperatures as a tool for the study of physical properties of matter. Non-Fermi liquid materials... Geometrically frustrated systems. Quantum tunneling in molecular magnets. Application of quantum magnets. Excursion in the Centre of Excellence of Low Temperature Physics.
Soft magnetic nanostructure materials prepared by milling and alloying: magnetic properties of small particles, magnetization processes, domain structure, milling and alloying.

**Recommended literature:**
S. Chikazumi: Physics of Magnetism, J. Willey and Sons, Inc. New York, London, Sydney, 1997.
C. Suryanarayana, Progress in Materials Science 46 (2001), 1-184
F. Close : The Cosmic Onion, 1990

Cindy Schwarz :A Tour of the Subatomic Zoo, 1997
Frank Close, Michael Marten, Christine Sutton : The Particle Odyssey-
A Journey to the Heart of Matter, 2002
http://vk.upjs.sk/~epog/2006/
Scientific journals

**Course language:**
english

**Notes:**

**Course assessment**
Total number of assessed students: 4

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

**Provides:** prof. RNDr. Peter Kollár, DrSc.

**Date of last modification:** 18.02.2020

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPE/ MMKV/17 | **Course name:** Multiculturalism and Multicultural Education |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 119

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 43.7 | 37.82 | 16.81 | 0.84 | 0.84 | 0.0 |

**Provides:** PaedDr. Michal Novocký, PhD.

**Date of last modification:** 08.06.2021

**Approved:**

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/OSY1/15 | **Course name:** Operating systems |
| **Course type, scope and the method:**<br>**Course type:** Lecture<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of ECTS credits:** 3 | |
| **Recommended semester/trimester of the course:** 3. | |
| **Course level:** I. | |
| **Prerequisities:** ÚINF/PRP2/15,(ÚINF/PAZ1a/15 and leboÚINF/ePAZ1a/15 and leboÚINF/PRG1/15) | |
| **Conditions for course completion:**<br>Test and oral exam | |
| **Learning outcomes:**<br>To gain knowledge about the basic architecture of the operating system. Understand algorithms for multi-process CPU allocation, interprocess communication, and memory allocation.<br>To be able to apply basic synchronization procedures and to solve problems of allocation of common resources for I / O operations.<br>Understand the organization of files and their protection by access rights. To be able to practically use the services of the Unix and Windows operating system. | |
| **Brief outline of the course:**<br>Operating system structure and basic functions.<br>Different kinds of operating systems and their history.<br>Multiprogramming, context switching, interrupts, time sharing, interoperability.<br>Processes, process management, threads, scheduling, interprocess communication<br>(race condition, mutual exclusion, deadlock, starvation).<br>Memory management, relocation, segmentation, paging, virtual memory.<br>I/O management, device drivers, interrupt handlers.<br>External memory (disk) - direct and sequential access.<br>File systems, file operations, directories, access control, access rights. | |
| **Recommended literature:**<br>1. A. Silberschatz, G. Gagne, P. Baer: Operating System Concepts, Wiley, 2002<br>2. A. S. Tanenbaum: Modern Operating Systems, Prentice-Hall, 2001 | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 304

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22.37 | 21.71 | 19.08 | 25.0 | 10.53 | 1.32 |

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

**Date of last modification:** 14.01.2020

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPE/Pg/15 | **Course name:** Pedagogy |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 639

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20.03 | 27.07 | 25.98 | 15.65 | 10.49 | 0.78 |

**Provides:** PaedDr. Michal Novocký, PhD.

**Date of last modification:** 08.06.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ ZFP1a/03 | **Course name:** Physics Practical I |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
The active work during semester and hand in all reports.
Vindication of reports.

**Learning outcomes:**
Developing proper laboratory habits, skills and verify their theoretical knowledge.

**Brief outline of the course:**
The goal of this laboratory exercises is to familiarize the students with measurement methods, with kinds and calculus of mistakes, with measured results processing, and with presentation of results. The students gain practical skills, and verify their theoretical knowledge of first semester introductory physics course. They develop proper laboratory habits.
Laboratory assignment:
1. Density measurements of liquids and solids.
2. Radius measurements of spherical cap. Measurements of surface using planimeter.
3. Gravitational acceleration measurements using mathematical and physical pendulum.
4. Moment of inertia measurement using physical and torsion pendulum.
5. Measurements of Young's modulus.
6. Measurement of coefficient of viscosity.
7. Measurement of the speed of sound.
8. Measurements of general gas constant and Boltzmann constant.
9. Measurements of thermal expansivity of air.
10. Measurements of thermal capacity of matter.
11. Measurement of the surface tension.

**Recommended literature:**
Degro, J., Ješková, Z., Onderová, Ľ., Kireš, M.: Základné fyzikálne praktikum I. (Basic physical measurements I), Ed. PF UPJŠ Košice 2007.
Standards STN ISO 31. Slovenský inštitút normalizácie v Bratislave (Slovak institute of technical standards in Bratislava),1997.

Ješková, Z.: Computer based experiments in thermodynamics using IP COACH,ed. PF UPJŠ in Košice, 2004.

**Course language:**
english

**Notes:**

**Course assessment**
Total number of assessed students: 256

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 56.25 | 25.78 | 13.67 | 3.52 | 0.78 | 0.0 |

**Provides:** doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Marián Kireš, PhD., doc. RNDr. Ján Füzer, PhD., doc. RNDr. Jozef Hanč, PhD.

**Date of last modification:** 29.03.2020

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ZFP1b/03 | **Course name:** Physics Practical II |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:** ÚFV/ZFP1a/03

**Conditions for course completion:**
Meausirnig of experimental tasks, their appreciation in the form of a written report, defending. Further evaluation is also a good theoretical preparation for the measurement of the task.

**Learning outcomes:**
The objectives of the laboratory are:
a. To gain some physical inside into some of the concepts presented in the lectures.
b. To gain some practice in data collection, analysis and interpretation of resumance.
c. To gain experience and report writing presentation and results.

**Brief outline of the course:**
Students on practical exercises are working in pairs experimental tasks in the field of electrical, electromagnetic and magnetic properties of matters.

**Recommended literature:**
Tumanski S, Handbook of magnetic measurements, CRC press, 2011.
Fiorillo F, Characterization and Measurement of Magnetic Materials, Elsevier, 2004.

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 217

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 64.98 | 20.74 | 12.44 | 1.38 | 0.0 | 0.46 |

**Provides:** doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Ján Füzer, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ ZFP1c/14 | **Course name:** Physics Practical III |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Measurements of experimental tasks, their evaluation in the form of a written report, which must be defended. As a part of evaluation there is is also a good theoretical preparation for the measurement of the task.

**Learning outcomes:**
To gain some physical inside into some of the concepts presented in the lectures. b. To gain some practice in data collection, analysis and interpretation of resumance. c. To gain experience and report writing presentation and results.

**Brief outline of the course:**
Oscilations. Pendulum. Composition and decomposition of oscillations. Resonance. The speed of sound. Refractive index. Lense's focal length. Interference. Diffraction. Diffraction and reflection of waves. Polarization. The speed of light. Quantum optics.

**Recommended literature:**
Degro,J., Ješková, Z., Onderová,Ľ., Kireš,M.: Základné fyzikálne praktikum I, PF UPJŠ Košice, 2006
P. Kollár a kol. Základné fyzikálne praktikum II, PF UPJŠ Košice, 2006
J. Brož Základy fysikálních měření, SPN Praha, 1981.

**Course language:**
slovak or english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 70.59 | 16.18 | 5.88 | 2.94 | 4.41 | 0.0 |

**Provides:** doc. RNDr. Marián Kireš, PhD., doc. RNDr. Ján Füzer, PhD.

**Date of last modification:** 29.03.2020

| **Approved:** |
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## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ ZFP1d/14 | **Course name:** Physics Practical IV |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
good theoretical preparation for measurement of the tasks, written tests,measurements of the experimental tasks, written reports of measurements

**Learning outcomes:**
Practice in nuclear physics.

**Brief outline of the course:**
1. Introduction to measurements.
2. Dosimetry measurements.
3. Statistic distribution of measured quantities.
4. Measurement time scale selection.
5. Absorption of beta rays.
6. Backward scattering of beta rays.
7. Scintillation gamma spectrometer.
8. Emulsion detector.
9. Franck Hertz experiment.
10. Beta - spectroscopy.
11. Energy dependence of the gamma-absorption coefficient.
12. MEDIPIX.
13. Interaction of photons with matter.

**Recommended literature:**
1. J.Vrláková, S.Vokál: Základné fyzikálne praktikum III, skriptá PF UPJŠ, Košice, 2012, dostupné
na
http://www.upjs.sk/public/media/5596/Zakladne-fyzikalne-praktikum-III.pdf

**Course language:**
slovak

**Notes:**

**Course assessment**
Total number of assessed students: 75

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 81.33 | 8.0 | 6.67 | 4.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Janka Vrláková, PhD., doc. RNDr. Adela Kravčáková, PhD., RNDr. Filoména Sopková

**Date of last modification:** 09.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/FDE/15 | **Course name:** Physics in Demonstration Experiments |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Seminar work – a project dealing with hands-on experiments and their role in Physics teachig.

**Learning outcomes:**
The goal of the course is to get better the understanding of basic physical concepts and phenomena through demonstrational physical experiments.

**Brief outline of the course:**
The course is aimed at the conceptual understanding of basic physical concepts and phenomena with the help of selected demonstrational experiments. The experiments concern the content of the subject Introductory physics and their realization is based on students´ active participation.

**Recommended literature:**
1. D.Halliday, R.Resnick, J.Walker: Fyzika, VUTIUM, Brno, 2000
2.K.Cummings, P.W.Law, E.F.Redish, P.J.Cooney: Understanding Physics,
John Wiley & Sons, Inc., 2004
3.P.G.Hewitt: Conceptual Physics, tenth edition, Pearson, Addison Wesley, 2006
4.Ľ.Onderová, M.Kireš, Z.Ješková, J.Degro: Praktikum školských pokusov II, PF UPJŠ, 2004

**Course language:**
Slovak

**Notes:**

**Course assessment**
Total number of assessed students: 30

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 86.67 | 3.33 | 6.67 | 3.33 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Marián Kireš, PhD.

**Date of last modification:** 16.06.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPPaPZ/PP/15 | **Course name:** Positive Psychology |

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Assessment is based on interim evaluation. The subject will be taught in both present and distance format. Up-to-date information concerning the subject for the given academic year can be found on the electronic board of the subject in the Academic information system of the UPJŠ.

**Learning outcomes:**
The aim of the course is to leanrn about the the basic theory and current research, as well as the possibility of application of Positive Psychology as a new and rapidly developing field of psychology. The aim of the subject is mainly to develop and apply critical thinking to the challenges and issues that Positive Psychology brings and raises in the context of the individual in contemporary society. Emphasis is placed on the ability to independently and critically process current topics of positive psychology.

**Brief outline of the course:**
1. Different perspectives on well-being nad happiness in psychology
2. Main theoretical approaches to positive psychology
3. Positive emotions and positivity
4. Meaningfulness
5. Positive interpersonal relations
6. Post-traumatic growth
7. Hope and optimism
8. Gratitude
9. Spirituality as a personality dimension
10. Wisdom
11. Positive institutions
12. New themes and topics in PP

**Recommended literature:**
Brewer, M. B, Hwestone, M: Emotion and Motivation, Blackwell, 2004
Deci, E., Ryan R. M., Handbook of Self – Determination Reasearch, Rochester, 2002
Křivohlavý, J.: Pozitivní psychologie. Praha, Portál, 2003
Křivohlavý, J.: Psychologie vděčnosti a nevděčnosti. Praha, Grada, 2007
Křivohlavý, J.: Psychologie moudrosti a dobrého života, Praha, Grada, 2012

Křivohlavý, J.: Psychologie pocitu štěstí, Grada, 2013
McAdams, D. P., The Person, New York, 2002
Seligman, M. E. P., & Csikszentmihalyi, M. (Eds.). (2000). Positive psychology [Special issue] American Psychologist, 55(1).
Říčan, P.: Psychologie náboženství a spirituality, Praha, Portál, 2007
Slezáčková, A.:Pruvodce pozitivní psychologií, Praha, Grada, 2012

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 280

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 98.21 | 1.07 | 0.36 | 0.0 | 0.36 | 0.0 |

**Provides:** Mgr. Jozef Benka, PhD. et PhD.

**Date of last modification:** 25.06.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

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

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

**Recommended literature:**
1. STALLINGS, William. Computer Organization and Architecture. Prentice Hall, 2002. ISBN 978-0-13-410161-3.

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 242

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 26.03 | 15.7 | 16.53 | 13.22 | 23.14 | 5.37 |

**Provides:** RNDr. Juraj Šebej, PhD.

**Date of last modification:** 09.07.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/PBS/15 | **Course name:** Pro-seminar to bachelor thesis |
|---|---|

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

**Number of ECTS credits:** 1

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Creating a website about a bachelor's thesis. Selection of bachelor thesis topic. Presentation of the bachelor's thesis assignment and its objectives. Preparation of an essay in the extent of 1 page on the motivation to select a bachelor's thesis. Creation of the bachelor's thesis assignment and its insertion into the AIS by the thesis supervisor.

**Learning outcomes:**
Basic knowledge of the principles of creation and structure of bachelor's theses. Criteria and requirements for selecting an appropriate bachelor thesis topic. Knowledge about the structure of the bachelor's thesis assignment.

**Brief outline of the course:**
1. Principles in creating a final thesis.
2. The presentations of bachelor thesis topics by potential supervisors.
3. The presentations of bachelor thesis topics by potential supervisors.
4. The presentations of bachelor thesis topics by potential supervisors.
5. Bachelor thesis and its objectives.
6. Assignment of bachelor thesis.
7. Basic types of bachelor theses.
8. Structure of different types of bachelor theses.
9. Requirements for final bachelor theses.
10. External company final theses.
11. Presentation of selected topics of final theses.
12. Presentation of selected topics of final theses.
13. Presentation of selected topics of final theses.

**Recommended literature:**
1. STN 01 6910. Rules of writing and editing documents. 2011.
2. STN ISO 2145. Documentation. Numbering of sections and subsections of written documents. 1997.
3. STN ISO 690. Information and documentation. Instructions for creating bibliographic references to information sources and their citation. 2012
4. KATUŠČÁK, Daniel. How to write final and qualification theses. Enigma, 2013

5. Scientific literature related to the topic of the final thesis according to the recommendation of the thesis supervisor.

**Course language:**
Slovak or English

**Notes:**

**Course assessment**
Total number of assessed students: 307

| abs | n |
|---|---|
| 94.14 | 5.86 |

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

**Date of last modification:** 26.08.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ SPP1a/15 | **Course name:** Programming environments in schools I |

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** ÚINF/PAZ1a/15

**Conditions for course completion:**
At least 50 % of the marks in the intermediate assessment
A minimum of 50 % marks in the mid-term and end-of-semester practical tests

**Learning outcomes:**
Ability to implement more complex algorithms algorithms in the Python programming language. Ability to design and program educational software in the Python programming language. Formulate and solve school computer science problems.

**Brief outline of the course:**
1. Introduction to Python, basic features of Python, syntax.
2. Simple data types (number, logical type), structured types (string, list, dictionary, set, tuple).
3. Control structures (loops, conditional statements, exception management).
4. Function definition (parameters, return value), function documentation.
5. Import and creation of modules.
6. Error types and error condition handling. Exception handling and raising.
7. Saving data to a file and reading data from a file. Data serializing. Open data and its analysis.
8. Testing the correctness of algorithms (doctest, unittest), test data.
9. Object-oriented programming. Design and implementation of custom classes.
10. Creation of graphical interface of programs.
11. Design criteria, design and programming of educational software.
12. Solving more complex algorithmic problems from real life or school practice using the object-oriented approach and the resources of the Python programming language.

**Recommended literature:**
PILGRIM, Mark. Ponořme se do Python(u) 3: Dive into Python 3. 1. Praha: CZ.NIC, c2010, 430 s. CZ.NIC. ISBN 978-80-904248-2-1. Dostupné také z: http://knihy.nic.cz/files/nic/edice/mark_pilgrim_dip3_ver3.pdf
SHIPMAN, John W. Tkinter 8.5 reference: a GUI for Python. Socorro, NM 87801: New Mexico Tech Computer Center, 2013. Dostupné také z: https://anzeljg.github.io/rin2/book2/2405/docs/tkinter/tkinter.pdf

GUNIŠ, Ján, Viera MICHALIČKOVÁ, Martin CÁPAY a Ľubomír ŠNAJDER. Riešenieproblémov a programovanie. Bratislava: Centrum vedecko-technických informácií SR, 2020.ISBN 978-80-89965-62-5.
HETLAND, Magnus Lie. Beginning Python: from novice to professional. New York: Distributed to the book trade worldwide by Springer-Verlag, c2005. ISBN 1-59059-519-X.
KRNÁČ, Jozef, Miloslava SUDOLSKÁ a Ľudovít TRAJTEĽ. Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika: Učiteľ s kompetenciami programátora. Bratislava: Štátny pedagogický ústav Bratislava, 2010. ISBN 978-80-8118-083-5.

**Course language:**
Slovak language, knowledge of English is only required to read Python documentation.

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 8.7 | 21.74 | 43.48 | 8.7 | 13.04 | 4.35 |

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

**Date of last modification:** 31.08.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ SPP1b/15 | **Course name:** Programming environments in schools II |

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:** ÚINF/SPP1a/15

**Conditions for course completion:**
Conditions for ongoing evaluation:
1. Educational software or game programmed in the Scratch environment,
2. A programming etude created for learning of programming in the MIT App Inventor environment.
3. Educational or assistive software programmed in the MIT App Inventor environment.
4. A programmed project using the BBC micro: bit kit.
Conditions for successful completion of the course:
Obtaining at least 50% of points for ongoing assignments.

**Learning outcomes:**
After completing this course, students are able to:
a) get an overview of educational programming environments,
b) acquire programming skills in selected educational programming environments,
c) develop the ability to design and program educational software for devices using their sensors and actuators.

**Brief outline of the course:**
1. Teaching algorithmization and programming in primary and secondary school - objectives, content, textbooks and methodological materials. Algorithmic computer games.
2. Programming in the Scratch environment.
3. Programming in the Scratch environment.
4. Programming in the Scratch environment.
5. Programming of mobile devices in the MIT App Inventor environment.
6. Programming of mobile devices in the MIT App Inventor environment.
7. Programming of mobile devices in the MIT App Inventor environment.
8. Programming of mobile devices in the MIT App Inventor environment.
9. Programming of mobile devices in the MIT App Inventor environment.
10. Programming BBC micro: bit kits in MS MakeCode environment.
11. Programming BBC micro: bit kits in MS MakeCode environment.
12. Overview of educational programming initiatives and development environments.

**Recommended literature:**

BELL, Charles A., 2017. Micropython for the internet of things: a beginner's guide to programming with Python on microcontrollers. New York, NY: Springer Science+Business Media. ISBN 9781484231227.
GUTSCHANK, Jörg et al., 2019. Coding in STEM Education [online]. Berlin: Science on Stage Deutschland e.V., 76 p. [cited 2021-7-10]. ISBN 978-3-942524-58-2. Available from: https://www.science-on-stage.eu/sites/default/files/material/coding_in_stem_education_en_2nd_edition.pdf
ŠNAJDER, Ľubomír, Gabriela LOVÁSZOVÁ, Viera MICHALIČKOVÁ and Ján GUNIŠ, 2020. Programovanie mobilných zariadení [online]. Bratislava: Centrum vedecko-technických informácií SR, 300 p. [cited 2020-11-30]. ISBN 978-80-89965-63-2. Available from: https://registracia.itakademia.sk/media/themes/nip-pmz.pdf
WOLBER, David, 2014. App Inventor: Vytvořte si vlastní aplikaci pro Android. Brno: Computer Press. ISBN 978-80-251-4195-3.
LOVÁSZOVÁ, Gabriela, Jana GALBAVÁ, Viera PALMÁROVÁ and Monika TOMCSÁNYIOVÁ, 2010. Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika: Malé programovacie jazyky. Bratislava: Štátny pedagogický ústav. ISBN 978–80–8118–066–8.
CODE.ORG. Learn today, build a brighter tomorrow.
Code.org [online]. [cited 2021-7-13]. Available from: https://code.org/
THE LIFELONG KINDERGARTEN GROUP AT MIT MEDIA LAB. Scratch - Imagine, Program, Share [online]. [cited 2021-7-13]. Available from: https://scratch.mit.edu/
MASSACHUSETTS INSTITUTE OF TECHNOLOGY. MIT App Inventor
Explore MIT App Inventor [online]. [cited 2021-7-13]. Available from: http://appinventor.mit.edu/
MICRO:BIT EDUCATIONAL FOUNDATION. BBC micro:bit [online]. [cited 2021-7-13]. Available from: https://microbit.org/
SPY O.Z. Učíme s Hardvérom [online]. [cited 2021-7-13]. Available from: https://www.ucimeshardverom.sk/

**Course language:**
Slovak or English

**Notes:**
By default, teaching is carried out face to face. If this is not possible (eg due to a pandemic), teaching is provided at a distance through video conferencing programs and LMS.

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.53 | 23.53 | 11.76 | 23.53 | 5.88 | 11.76 |

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

**Date of last modification:** 01.08.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PRS/15 | **Course name:** Programming of robotic kits |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 3 **Per study period:** 42<br>**Course method:** present | |
| **Number of ECTS credits:** 3 | |
| **Recommended semester/trimester of the course:** 3. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<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. | |
| **Learning outcomes:**<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. | |
| **Brief outline of the course:**<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. | |
| **Recommended literature:**<br>1. BUMGARDNER, J. (2007) The Origins of Mindstorms. Wired, 2007. http://www.wired.com/geekdad/2007/03/the_origins_of_/<br>2. Carnegie Mellon. Robotics Academy. http://www.education.rec.ri.cmu.edu/<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 vzdělávání, ZČU v Plzni, 2014. https://lego.zcu.cz/web/ | |
| **Course language:** | |
| **Notes:** | |

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 53.06 | 22.45 | 12.24 | 2.04 | 0.0 | 10.2 |

**Provides:** RNDr. Zuzana Bednárová, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PSW1/06 | **Course name:** Programming of web-pages |

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:** (ÚINF/DBS1a/15 and leboÚINF/DBS/15),ÚINF/PAZ1a/15

**Conditions for course completion:**
50% of the marks from continuous assignments

**Learning outcomes:**
An overview of modern technologies for creating dynamic websites. Describing and appliyng the basic principles of creating dynamic web pages. Utilize client-side (JavaScript) and server-side (PHP) web programming technologies. Using relational databases (MySQL) to create application web pages. Know the security risks of dynamic websites and be able to eliminate them.

**Brief outline of the course:**
1. JavaScript - introduction to JavaScript programming.
2. JavaScript - communication with the user, validation of data in forms using JavaScript.
3. JavaScript - introduction to using the jQuery library.
4. PHP - introduction to PHP programming.
5. PHP - data and control structures of the PHP language.
6. PHP - communication with the user, validation of data in forms using PHP.
7. PHP - object oriented problem solving in PHP language. File manipulation.
8. PHP - User authentication (cookies, session).
9. MySQL - introduction to working with MySQL database system.
10. MySQL - Simple applications using the database for data storage and access.
11. Web application security - an introduction to web application security.
12. Web application security - the most common web application security problems and how to eliminate them.

**Recommended literature:**
BLUM, Richard. PHP, MySQL& JavaScript: All-in-One. Hoboken, New Jersey: John Wiley, 2018. ISBN 978-1-119-46838-7.
KROMANN, Frank M. Beginning PHP and MySQL: From Novice to Professional. 5. CA, USA: Apress, 2018. ISBN 978-1-4302-6043-1.
HUSEBY, Sverre H. Zranitelný kód. Brno: Computer Press, 2006, 207 s. ISBN 80-251-1180-6.
SNYDER, Chris, Thomas MYER a Michael SOUTHWELL. Pro PHP Security: From Application Security Principles to the Implementation of XSS Defenses. 2. United States of America: Apress, 2010. ISBN 978-1-4302-3318-3.

**Course language:**
Slovak language, knowledge of English language is only necessary for reading documentation.

**Notes:**
Content prerequisite: WBdi/15 Web and user interface design

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

| abs | n | neabs | z |
|---|---|---|---|
| 65.22 | 34.78 | 0.0 | 0.0 |

**Provides:** PaedDr. Ján Guniš, PhD.

**Date of last modification:** 31.08.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ PAZ1a/15 | **Course name:** Programming, algorithms, and complexity |

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

**Number of ECTS credits:** 8

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

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

**Prerequisities:**

**Conditions for course completion:**
Graded activities during semester: assignments, small exams, midterm, final project.
Final examination: practical finalterm focused on a complex task.
Rules to pass the subject: Pass the minimal limit of points for category of homeworks (assignments, final project) and tests (small exams, midterm). Get at least 42% from the finalterm and pass the defined limit of total points for all graded activities.

**Learning outcomes:**
Get an ability to implement basic Java programs and obtain essential knowledge related to object-oriented programming.

**Brief outline of the course:**
1. Introduction to Java and JPAZ2 framework, first Eclipse project, interactive communication with objects using turtle graphics, repeating code in loops, notion of class, object, and method.
2. For-loops, local variables, variable types, arithmetic expressions, random numbers, random walk, conditions.
3. While-loop, returning a value from a method, reference and reference variables, debugging.
4. Primitive and reference types, chars, String objects (including basic algorithms), mouse events, instance variables.
5. Array of primitive values and array of references, simple array algorithms.
6. Advanced array algorithms, two-dimensional array.
7. Exceptions and exception handling, files and directories, writing to text files.
8. Reading from text files.
9. Creating classes, encapsulation, getters and setters, constructors and their hierarchy, method overloading.
10. Inheritance and polymorphism.
11. Java Collections Framework, ArrayList class, wrapper classes for primitive types and autoboxing, interfaces List, Set, Map and their implementations, methods equals and hashCode.
12. Access modifiers, abstract classes and methods, creating and implementing interfaces, sorting, static methods and variables.
13. Creating and throwing exceptions, checked and runtime exceptions, JavaDoc, Maven.

**Recommended literature:**

1. ECKEL, Bruce. Thinking in Java. Fourth edition. Upper Saddle River, NJ: Prentice Hall, c[2006]. ISBN 978-01-318-7248-6.
2. PECINOVSKÝ, Rudolf. OOP: naučte se myslet a programovat objektově. Brno: Computer Press, 2010. ISBN 978-80-251-2126-9.
3. SIERRA, Kathy a Bert BATES. Head first Java. Vyd. 2. Sebastopol: O´Reilly, 2005. ISBN 978-05-960-0920-5.

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

**Notes:**

**Course assessment**
Total number of assessed students: 717

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 16.18 | 7.39 | 11.44 | 15.48 | 15.06 | 34.45 |

**Provides:** RNDr. Juraj Šebej, PhD., RNDr. Zuzana Bednárová, PhD., RNDr. Miroslav Opiela, PhD., Mgr. Antónia Matisová, Mgr. Zoltán Szoplák

**Date of last modification:** 31.08.2021

**Approved:**

**COURSE INFORMATION LETTER**

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

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

**Number of ECTS credits:** 7

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

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

**Prerequisities:** ÚINF/PAZ1a/15

**Conditions for course completion:**
Graded activities during semester: assignments, small theoretical exams, practical and theoretical midterm.
Final examination: practical and theoretical finalterm.
Rules to pass the subject: Get at least 50% from theoretical activities (small exams, theoretical midterm and theoretical finalterm) and from practical activities (practical midterm and finalterm). Pass the defined limit of total points for all graded activities.

**Learning outcomes:**
To know essential algorithms, data structures, and methods used for efficient algorithms design. To understand time complexity analysis. To practice efficient implementation of algorithms. To recognize combinatorial and graph algorithms.

**Brief outline of the course:**
1. Recursion and fractals.
2. Binary search, basic sorting algorithms, time complexity analysis, O-notation.
3. Basic data structures and algorithms: linked list, stack, queue.
4. Trees and their applications.
5. Efficient sorting algorithms (QuickSort, MergeSort, HeapSort).
6. Backtracking.
7. Dynamic programming, divide and conquer strategy.
8. Unweighted graphs, graph traversal, graph topological sort.
9. Weighted graphs, the shortest path algorithms.
10. Minimum spanning tree, greedy algorithms.
11. Hashing, amortized time complexity, string-searching algorithms.

**Recommended literature:**
1. WRÓBLEWSKI, Piotr. Algoritmy: datové struktury a programovací techniky. Brno: Computer Press, 2004. ISBN 80-251-0343-9.
2. CORMEN, Thomas H. Introduction to algorithms. 3rd ed. Cambridge: MIT Press, c2009. ISBN 978-0-262-03384-8.
3. KLEINBERG, Jon a Éva TARDOS. Algorithm design. Thirteenth impression. Noida, India: Pearson, c2014. ISBN 9789332518643.

4. MAREŠ, Martin a Tomáš VALLA. Průvodce labyrintem algoritmů. Praha: CZ.NIC, z.s.p.o., 2017. CZ.NIC. ISBN 978-80-88168-19-5.

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

**Notes:**

**Course assessment**
Total number of assessed students: 1222

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 13.75 | 7.53 | 9.9 | 19.31 | 21.52 | 27.99 |

**Provides:** RNDr. Zuzana Bednárová, PhD., RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD., Mgr. Antónia Matisová, Mgr. Gabriela Vozáriková

**Date of last modification:** 31.08.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPPaPZ/Ps/15 | **Course name:** Psychology |
|---|---|

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

**Number of ECTS credits:** 2

**Recommended semester/trimester of the course:** 1., 3., 5.

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 517

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22.82 | 16.05 | 21.66 | 18.57 | 17.99 | 2.9 |

**Provides:** PhDr. Anna Janovská, PhD., Mgr. Ondrej Kalina, PhD.

**Date of last modification:** 28.06.2021

**Approved:**

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPPaPZ/PKŽ/15 | **Course name:** Psychology of Everyday Life |

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
The evaluation of the course and its subsequent completion will be based on clearly and objectively set requirements, which will be set in advance and will not change. The aim of the assessment is to ensure an objective and fair mapping of the student's knowledge while adhering to all ethical and moral standards. There is no tolerance for students' fraudulent behavior, whether in the teaching process or in the assessment process.
1. Active participation in seminars
2. Elaboration and presentation of PPT presentation on the assigned topic. Maximum number of points 20; minimum number of points 11.
3. Elaboration of an essay in the range of 4xA4 (standard pages). Maximum number of points 20; minimum number of points 11.
The final evaluation (grade) is the sum of points for the presentation and the essay.
A 40b - 37b
B 36b - 33b
C 32b - 29b
D 28b - 25b
E 24b - 21b
FX 20b - 0b

**Learning outcomes:**
The student is able to demonstrate an understanding of the individual's behavior in selected everyday situations such as conflict, group influence, empathy, helping, aggression, etc.
The student is able to describe, explain and evaluate the psychological mechanisms that occur in everyday situations.
The student is able to apply basic psychological knowledge to himself (self-regulation) but also in interaction with others (cooperation).
The method of teaching the subject will be oriented to the student. Speakers will be interested in the needs, expectations and opinions of students so as to encourage them to think critically by expressing respect and feedback on their opinions and needs.
The content of the curriculum will be based on primary and high-quality sources that will reflect the topicality of the topics so as to ensure the connection of the curriculum with other subjects and also

the connection of the curriculum with practice. Students will be expected to take an active approach in lectures and seminars with an emphasis on their independence and responsibility.

**Brief outline of the course:**
How to understand human behavior (overview of basic approaches in psychology); Basic overview of cognitive processes; Learning processes and their use in practice; Social influences, prosocial and antisocial behavior; How human emotions and motivations work; Deciding - why and when we take risks; Childhood experiences and their relationship to adulthood; Abnormal behavior, mental disorders and therapeutic approaches

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 51.22 | 14.02 | 25.61 | 6.71 | 1.83 | 0.61 |

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

**Date of last modification:** 24.06.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/KVM/15 | **Course name:** Quantum Mechanics I. |
|---|---|

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
To become familiar with elementary principles of quantum mechanics and to illustrate its possible applications on selected examples.

**Brief outline of the course:**
A subject matter, experimental and theoretical foundations of quantum mechanics (QM). Basic axioms of QM. Schrödinger equation and its solution for a square potential well, harmonic oscillator and spherically symmetric potentials. Tunnel effect and over-barrier reflection. Spin and Pauli matrices. Systems of identical particles, bosons, fermions and Pauli exclusion principle.

**Recommended literature:**
1. Ľ. Tóth, M. Tóthová, Kvantová a štatistická fyzika I, Rektorát Univerzity P. J. Šafárika, 1982. (in Slovak language)
2. Ľ. Skála, Úvod do kvantovej mechaniky, Academia, Praha, 2005. (in Czech language)
3. J. Pišút, L. Gomolčák, Úvod do kvantovej mechaniky, Bratislava 1983. (in Slovak language)
4. W. Greiner, Quantum Mechanics, 4th edition, Springer, Berlin, 2000.
5. A. C. Philips, Introduction to Quantum Mechanics, Wiley, Weinheim, 2003.
6. D. J. Griffiths, Introduction to Quantum Mechanics, Prentice Hall, New Jersey, 1995.

**Course language:**
EN - english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22.22 | 18.52 | 25.93 | 18.52 | 3.7 | 11.11 |

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

**Date of last modification:** 03.05.2015

| **Approved:** |
| --- |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/RPBI/20 | **Course name:** Resolving computer security incidents |
|---|---|

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

**Number of ECTS credits:** 3

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

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

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

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

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

**Date of last modification:** 08.02.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPE/ OLŠ/15 | **Course name:** School Administration and Legislation |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 234

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 44.44 | 26.92 | 17.09 | 7.69 | 2.99 | 0.85 |

**Provides:** doc. PaedDr. Renáta Orosová, PhD., PaedDr. Janka Ferencová, PhD.

**Date of last modification:** 08.06.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚTVŠ/ ÚTVŠ/CM/13 | **Course name:** Seaside Aerobic Exercise |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week: Per study period:** 36s
**Course method:** combined, present

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
Conditions for course completion:
Attendance

**Learning outcomes:**
Learning outcomes:
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.

**Brief outline of the course:**
Brief outline of the course:
1. Basics of seaside aerobics
2. Morning exercises
3. Pilates and its application in seaside conditions
4. Exercises for the spine
5. Yoga basics
6. Sport as a part of leisure time
7. Application of projects of productive spending of leisure time for different age and social groups (children, young people, elderly)
8. Application of seaside cultural and art-oriented activities in leisure time

**Recommended literature:**

**Course language:**

**Notes:**

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

| abs | n |
|---|---|
| 12.2 | 87.8 |

| |
|---|
| **Provides:** Mgr. Agata Horbacz, PhD. |
| **Date of last modification:** 15.03.2019 |
| **Approved:** |

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KF/ VKFV/07 | **Course name:** Selected Topics in Philosophy of Education (General Introduction) |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 3., 5. | |
| **Course level:** I. | |
| **Prerequisities:** KF/DF1/05 | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

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

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

| | |
|---|---|
| **Provides:** doc. PhDr. Pavol Tholt, PhD., mim. prof. | |
| **Date of last modification:** | |
| **Approved:** | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ VKI/15 | **Course name:** Selected topics in informatics and information technologies |
|---|---|

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
Problems solved during the semester. Examination.

**Learning outcomes:**
To be able to program on primitive theoretical computers RAM and RASP. To be able to evaluate programs by the number of operations and of used cells.

**Brief outline of the course:**
To study theoretical models the computers RAM and RASP with respect to algorithms and their complexity. Solving problems by means the virtual computer RASP. To determine time and space complexity of the devised programs.

**Recommended literature:**
Aho A.V., Hopcroft J.E., Ullman J.D.: The design and analysis of algorithms. Addison-Wesley Publishing Company, 1974.

**Course language:**
slovak or english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 26.67 | 28.33 | 23.33 | 3.33 | 10.0 | 8.33 |

**Provides:** RNDr. Zuzana Bednárová, PhD.

**Date of last modification:** 10.02.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚINF/ SRP1/15 | **Course name:** Seminar in informatics and information technologies |
|---|---|

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

**Number of ECTS credits:** 4

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 59.26 | 14.81 | 11.11 | 3.7 | 0.0 | 11.11 |

**Provides:** prof. RNDr. Stanislav Krajči, PhD., RNDr. Rastislav Krivoš-Belluš, PhD., RNDr. Zuzana Bednárová, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPO/ SPKVV/15 | **Course name:** Social and Political Context of Education |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 57

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 31.58 | 36.84 | 19.3 | 10.53 | 1.75 | 0.0 |

**Provides:** Mgr. Ján Ruman, PhD.

**Date of last modification:** 13.05.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:** ÚINF/DBS1a/15 and leboÚINF/DBdi/15

**Conditions for course completion:**

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

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

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 313

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 18.21 | 23.0 | 20.13 | 17.57 | 19.81 | 1.28 |

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KGER/OJPV1/07 | **Course name:** Specialised German Language - Natural Sciences 1 |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 144

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 23.61 | 22.92 | 24.31 | 20.83 | 7.64 | 0.69 |

**Provides:** Mgr. Blanka Jenčíková

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚTVŠ/ TVa/11 | **Course name:** Sports Activities I. |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** combined, present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 1. | |
| **Course level:** I., I.II., II. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Min. 80% of active participation in classes. | |
| **Learning outcomes:**<br>Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve. | |
| **Brief outline of the course:**<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, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.<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 unfitness.<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. | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 12859

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 87.01 | 0.08 | 0.0 | 0.0 | 0.0 | 0.04 | 8.1 | 4.77 |

**Provides:** Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.

**Date of last modification:** 13.05.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
active participation in classes - min. 80%.

**Learning outcomes:**
Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.

**Brief outline of the course:**
Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.
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 unfitness.
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.

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 11675

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 84.52 | 0.56 | 0.02 | 0.0 | 0.0 | 0.05 | 10.63 | 4.22 |

| |
|---|
| **Provides:** Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD. |
| **Date of last modification:** 13.05.2021 |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
min. 80% of active participation in classes

**Learning outcomes:**
Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.

**Brief outline of the course:**
Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.
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 unfitness.
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.

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 7873

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 88.8 | 0.05 | 0.01 | 0.0 | 0.0 | 0.03 | 4.08 | 7.04 |

| |
|---|
| **Provides:** Mgr. Marcel Čurgali, Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD. |
| **Date of last modification:** 13.05.2021 |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

**Course ID:** ÚTVŠ/TVd/11

**Course name:** Sports Activities IV.

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

**Number of ECTS credits:** 2

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

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

**Prerequisities:**

**Conditions for course completion:**
min. 80% of active participation in classes

**Learning outcomes:**
Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.

**Brief outline of the course:**
Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.
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 unfitness.
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.

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 5125

| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
|---|---|---|---|---|---|---|---|
| 83.14 | 0.31 | 0.04 | 0.0 | 0.0 | 0.0 | 7.75 | 8.76 |

| |
|---|
| **Provides:** Mgr. Marcel Čurgali, Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD. |
| **Date of last modification:** 13.05.2021 |
| **Approved:** |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ STA1N/15 | **Course name:** Statistical Physics |
| **Course type, scope and the method:**<br>**Course type:** Lecture / Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 / 2 **Per study period:** 28 / 28<br>**Course method:** present | |
| **Number of ECTS credits:** 4 | |
| **Recommended semester/trimester of the course:** 6. | |
| **Course level:** I. | |
| **Prerequisities:** ÚFV/KVM/08 and leboÚFV/KVM/15 | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:**<br>Slovak, English | |
| **Notes:** | |

**Course assessment**
Total number of assessed students: 33

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30.3 | 33.33 | 18.18 | 9.09 | 9.09 | 0.0 |

| |
|---|
| **Provides:** prof. RNDr. Michal Jaščur, CSc., RNDr. Jana Čisárová, PhD. |
| **Date of last modification:** 02.04.2020 |
| **Approved:** |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SVL1/03 | **Course name:** Structure and Properties of Solids |
|---|---|

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
50% maintained output, written test
50% final exam

**Learning outcomes:**
To explain basic problems of Solid State physics. The course is mainly oriented on fundamental type of lattices, symetry and crystal structure, X.ray diffractometry, Thermal properties, mechanical properties and conductivity of solids. The course alows to continue education in specialized topis of Condensed Matter like: Magnetic properties, Low temperature physics, Experimental methods of CM, Semiconductors atc.

**Brief outline of the course:**
Periodic array of atoms. Fundamental type of lattices. Index systems for crystal planes. Simple crystal structure. Symetry and crystal structure. Point and space groups. Crystal binding and elastic constants. Wave diffraction and the reciprocal lattice. X.ray diffractometry. Brag´s law, Laue conditions, scatering of x-rays, Neutrons and neutron scattering, CW - diffractometer, Ewald´s sphere, Diffraction on powder samples, Structure factor, Ocupation factor, Atomic displacement factor. Thermal properties. Phonon heat capacity, thermal conductivity. Free electron Fermi gas. Energy bands. Semiconductor crystals. Superconductivity.

**Recommended literature:**
1. Ch. Kittel, Solid State Physics,Springer,1985.
3.Fundamentals of Powder Diffraction and Structural Characterization of Materials, Vitalij K. Pecharsky & Peter Y. Zavalij , Kluwer Academic Publishers, 2003.
4.Structure Determination from Powder Diffraction Data, Edited by W.I.F. David, K. Shankland, L.B. McCusker, C. Bärlocher, Oxford University Press, 2006

**Course language:**
english

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40.82 | 26.53 | 16.33 | 12.24 | 2.04 | 2.04 |

**Provides:** prof. RNDr. Pavol Sovák, CSc., RNDr. Jozef Bednarčík, PhD.

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

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

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

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

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

**Course language:**

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 32.88 | 21.92 | 20.55 | 13.7 | 10.96 | 0.0 |

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

**Date of last modification:** 01.06.2015

| **Approved:** |
| --- |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚMV/ DGS/15 | **Course name:** Students` Digital Literacy |

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**
continuous assessment and final project

**Learning outcomes:**
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.

**Brief outline of the course:**
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.

**Recommended literature:**
1. Bruff, D. (2009). Teaching with classroom response systems: Creating active learning environments. San Francisco: Jossey-Bass.
2. Byrne, R. (2012). Google Drive and Docs for Teachers. Free Tech for Teachers.
3. Kawasaki, G. (2012). What the Plus! Google+ for the Rest of Us. Amazon igital Services.
4. Kolb, L. (2011). Cell Phones in the Classroom: A Practical Guide for Educators. International Society for Technology in Education.

**Course language:**
Slovak

**Notes:**

| **Course assessment**<br>Total number of assessed students: 250 | |
|---|---|
| abs | n |
| 96.0 | 4.0 |
| **Provides:** doc. RNDr. Stanislav Lukáč, PhD., doc. RNDr. Jozef Hanč, PhD., doc. RNDr. Ľubomír Šnajder, PhD. | |
| **Date of last modification:** 03.05.2015 | |
| **Approved:** | |

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚTVŠ/ LKSp/13 | **Course name:** Summer Course-Rafting of TISA River |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 36s<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** I., II. | |
| **Prerequisities:** | |
| **Conditions for course completion:**<br>Conditions for course completion:<br>Attendance<br>Final assessment: Raft control on the waterway (attended/not attended) | |
| **Learning outcomes:**<br>Learning outcomes:<br>Students have knowledge of rafts (canoe) and their control on waterway. | |
| **Brief outline of the course:**<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 | |
| **Recommended literature:** | |
| **Course language:** | |
| **Notes:** | |

| **Course assessment**<br>Total number of assessed students: 153 | |
|---|---|
| abs | n |
| 45.75 | 54.25 |
| **Provides:** Mgr. Dávid Kaško, PhD. | |
| **Date of last modification:** 18.03.2019 | |
| **Approved:** | |

## COURSE INFORMATION LETTER

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

| **Course assessment**<br>Total number of assessed students: 393 | |
|---|---|
| abs | n |
| 44.53 | 55.47 |
| **Provides:** MUDr. Peter Dombrovský, Mgr. Ladislav Kručanica, PhD. | |
| **Date of last modification:** 15.03.2019 | |
| **Approved:** | |

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

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

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

**Number of ECTS credits:** 5

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

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

**Prerequisities:**

**Conditions for course completion:**

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

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

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

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 405

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 25.43 | 10.12 | 12.59 | 11.36 | 27.16 | 13.33 |

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

**Date of last modification:** 03.05.2015

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ TMEU/15 | **Course name:** Theoretical Mechanics |
|---|---|

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

**Number of ECTS credits:** 3

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

**Course level:** I.

**Prerequisities:** ÚFV/VF1a/12 and leboÚFV/VFM1a/15

**Conditions for course completion:**
Two tests to deal with specific tasks mechanics.
Final examination.

**Learning outcomes:**
To acquaint students with principles of the theoretical mechanics.

**Brief outline of the course:**
Mechanics of particle system with constraints. Principle of virtual work and d'Alembert's principle. Lagrange's function and Lagrange's equations of motion. Hamilton's principle, Hamilton's function and Hamilton's canonical equations of motion. Mechanics of rigid body. Kinematics and dynamics of rigid body.

**Recommended literature:**
1. Meirovitch L.: Methods of Analytical dynamics, McGraw-Hill, New York, 1970.
2. Taylor T.T.: Mechanics: Classical and Quantum, Pergamon Press, Oxford, 1976.
3. Strelkov S.P.: Mechanics, Mir Publishers, Moscow, 1985.
4. Greiner W.: Classical Mechanics, Springer-Verlag, Berlin, 2010.
5. Goldstein H.: Classical Mechanics, Addison-Wesley, London, 1970.
6. Barger V., Olsson M.: Classical Mechanics: A Modern Perspective, McGraw-Hill, London, 1973.

**Course language:**
Slovak

**Notes:**

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

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 41.94 | 6.45 | 9.68 | 25.81 | 6.45 | 9.68 |

**Provides:** prof. RNDr. Michal Jaščur, CSc.

**Date of last modification:** 27.09.2016

| **Approved:** |
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## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** KPE/ TVE/08 | **Course name:** Theory of Education |
|---|---|

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

**Number of ECTS credits:** 2

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

**Course level:** I.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Notes:**

**Course assessment**
Total number of assessed students: 501

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 36.93 | 32.93 | 20.36 | 5.99 | 1.6 | 2.2 |

**Provides:** Mgr. Katarína Petríková, PhD.

**Date of last modification:** 08.06.2021

**Approved:**

## COURSE INFORMATION LETTER

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

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/TEP1/03 | **Course name:** Theory of the Electromagnetic Field |
|---|---|

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

**Number of ECTS credits:** 5

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

**Course level:** I.

**Prerequisities:** ÚFV/VFM1b/15 and leboÚFV/VF1b/03

**Conditions for course completion:**
Two tests to deal with specific tasks theory of the electromagnetic field.
Examination.

**Learning outcomes:**
To acquaint students with principles of a theory of the electromagnetic field.

**Brief outline of the course:**
Maxwell equations in vacuum. Scalar and vector potentials. Conservation laws. Electrostatic field. Static magnetic field. Maxwell equations in macroscopic media. Quasistatic electromagnetic field. Electromagnetic waves. Radiation of electromagnetic waves.

**Recommended literature:**
1. Jackson J.D.: Classical Electrodynamics, John Wiley, New York, 1975.
2. Rao N.N.: Basic Electromagnetics with Applications, Prentice-Hall, New Jersey, 1972.
3. Greiner W.: Classical Electrodynamics, Springer-Verlag, New York, 1998.

**Course language:**
1. Slovak,
2. English

**Notes:**

**Course assessment**
Total number of assessed students: 302

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 27.48 | 8.61 | 17.55 | 22.19 | 15.89 | 8.28 |

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

**Date of last modification:** 27.03.2020

**Approved:**

## COURSE INFORMATION LETTER

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚINF/ TYS1/15 | **Course name:** Typographical systems |
| **Course type, scope and the method:**<br>**Course type:** Practice<br>**Recommended course-load (hours):**<br>**Per week:** 2 **Per study period:** 28<br>**Course method:** present | |
| **Number of ECTS credits:** 2 | |
| **Recommended semester/trimester of the course:** 6. | |
| **Course level:** I. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:**<br>To provide the basic information on principles for typesetting of documents containing mathematical formulas in Plain TeX, AMS-TeX, and LaTeX. | |
| **Brief outline of the course:**<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. | |
| **Recommended literature:**<br>1. D. E. Knuth, The TeXbook, Computers and Typesetting, Addison-Wesley, Reading, Massachusetts, 1986.<br>2. M. Doob, Jemný úvod do TeXu, CSTUG, 1990; èeský preklad z "A Gentle Introduction to TeX" (text vo¾ne prístupný v CTAN archíve).<br>3. O. Ulrych, AMS-TeX za 59 minút, (verzia 1.0), Praha, 1989.<br>4. J. Chlebíková, AMS-TeX (verzia 2.0), Bratislava, 1992.<br>5. M. Spivak, The Joy of TeX, Amer. Math. Soc., 1986.<br>6. L. Lamport, LaTeX: A Document Preparation System, Addison-Wesley, Massachusetts, 1986.<br>7. L. Lamport, MakeIndex: An index processor for LaTeX, 17 February 1987.<br>8. J. Rybièka, LaTeX pro začátečníky, Konvoj, Brno, 1995.<br>9. H. Partl, E. Schlegl, I. Hyna, P. Sýkora, LaTeX – Stručný popis.<br>10. T. Oetiker, H. Partl, I. Hyna, E. Schlegl, M. Kocer, P. Sýkora, Ne příliš stručný úvod do systému LaTeX2e (neboli LaTeX2e v 73 minutách).<br>11. M. Goossens, F. Mittelbach, and A. Samarin, The LaTeX Companion, Addison-Wesley, Reading, Massachusetts, 1994. Kapitola 8 je volne prístupná v TeX archívoch (ch8.pdf). 4<br>12. G. Grätzer, Math into LaTeX, 3rd edition, Birkhäuser, Boston, 2000. | |
| **Course language:**<br>Slovak or english | |

| **Notes:** | | | | | |
|---|---|---|---|---|---|
| **Course assessment**<br>Total number of assessed students: 251 | | | | | |
| A | B | C | D | E | FX |
| 48.21 | 17.93 | 19.92 | 6.37 | 6.77 | 0.8 |
| **Provides:** prof. RNDr. Stanislav Krajči, PhD. | | | | | |
| **Date of last modification:** 10.02.2021 | | | | | |
| **Approved:** | | | | | |